

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—24TH YEAR.

SYDNEY, SATURDAY, JUNE 12, 1937.

No. 24.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.	MEDICAL SOCIETIES—	Page.
Syphilis and Neuro-Syphilis Treated by Electro-pyrexia, by GUY P. U. PRIOR, M.R.C.S., L.R.C.P. 895		The Melbourne Pædiatric Society	928
The Soldier-Doctor, by LAURENCE DUNCAN	910	CORRESPONDENCE—	
Suppuration in the Petrous Temporal in Mastoiditis, by ERIC GUTTERIDGE, M.D., D.L.O., F.R.C.S., F.R.A.C.S.	916	A Symposium on Cancer	930
		Hereditary Multiple Telangiectasia	931
		News, Newspapers and Medical Practitioners	931
REPORTS OF CASES—		OBITUARY—	
The Early Diagnosis of Tetanus, by MARY C. DE GARIS, M.D., B.S.	918	Thomas Ernest Green	931
REVIEWS—		POST-GRADUATE WORK—	
Endocrinology	920	Course of Radiation Therapy in the Treatment of Cancer	932
NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—		LEGAL—	
Regional Anatomy	920	Roche versus Quick	933
A Medical Dictionary	920	PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS—	
LEADING ARTICLES—		Queensland	933
Medical Practice in Queensland	921	CORRIGENDUM	933
CURRENT COMMENT—		NOTICE	933
Arthritis in Women	922	BOOKS RECEIVED	933
The Adelaide Congress	923	DIARY FOR THE MONTH	934
ABSTRACTS FROM CURRENT MEDICAL LITERATURE—		MEDICAL APPOINTMENTS	934
Ophthalmology	924	MEDICAL APPOINTMENTS VACANT, ETC.	934
Oto-Rhino-Laryngology	924	MEDICAL APPOINTMENTS: IMPORTANT NOTICE	934
BRITISH MEDICAL ASSOCIATION NEWS—		EDITORIAL NOTICES	934
Scientific	926		
Nominations and Elections	927		

SYPHILIS AND NEURO-SYPHILIS TREATED BY ELECTROPYREXIA.¹

By GUY P. U. PRIOR, M.R.C.S. (England),
L.R.C.P. (London),
Beecroft, New South Wales.

WAGNER VON TAUREGG first published in 1918 the results of treatment of *dementia paralytica* by fever invoked by the inoculation of malaria. Since then various other means of producing heat for the treatment of the same and allied disease have been called into use, such as the injection of vaccine, protein shock, sulphur *et cetera*. All of these were of some aid, but the benefits obtained could not be compared with those resulting from malaria.

¹ By kind permission of the Minister of Health, New South Wales.

² Read at a combined meeting of the Section of Neurology and Psychiatry and the Section of Medicine of the New South Wales Branch of the British Medical Association on February 13, 1937.

In 1929 Neymann and Osborne published their paper on "Artificial Fever Produced by High Frequency Currents".⁽¹⁾ They showed that by electrical means the patient's temperature could be raised to any desired degree and maintained at this degree as long as thought desirable. This was a great advance over any other method of producing heat.

At this time Neymann and Osborne used a specially constructed diathermic machine, capable of delivering 6,000 milliamperes. Experience showed that lesser currents could be used with greater safety. An open tungsten spark gap type was substituted with a milliamperage to 4,000. Large electrodes of tinfoil or lead were used. Later Neymann devised an electrode, backed with rubber, impregnated with minute particles of zinc, incapable of producing burns. These we have found extremely satisfactory, but are expensive and not of long life. In THE MEDICAL JOURNAL OF AUSTRALIA of June 25, 1932, and in the second edition of Dark's

"Diathermy" the details of producing heat with the diathermy machine have been described, together with the results I obtained in my first twenty-four cases.⁽²⁾

The next stage in the development of electrically produced heat was the introduction of the inductotherm machine, which seems to have rendered diathermy, as a means of producing hyperpyrexia, a thing of the past. The inductotherm abolishes the use of electrodes and removes the risks of burns. With it the patient becomes the centre of a magnetic field and no current passes through him. The heat is produced by eddy currents, similar to those used in the induction furnace for the production of high-grade steel.

More recently an air condition chamber has been built. In this the air is heated and humidified and forced to circulate through the chamber in which the patient is placed. It is described by Desjardens, Stuhler and Popp⁽³⁾ in their paper "Fever Therapy for Gonococcal Infections". With the use of this chamber the patient's temperature is raised to 41.1° C. (106° F.) in from sixty to ninety minutes.

The authors speak highly of this method, claim safety and satisfactory results, and say that it is used in the Mayo Clinic. Reading their papers leaves the impression that difficulties, such as vomiting and tetany, are met with that are not met with in inductothermy and diathermy. They, in treating the gonococcal infections, run a temperature for some hours between 41.1° and 41.5° C. (106° and 107° F.), which is about 1° F. higher than is thought necessary in the treatment of syphilitic infections. Whatever its merits, it can hardly be safer or simpler to use than the inductotherm machine.

It is to the use of diathermy and inductothermy in the production of heat in the treatment of neurosyphilis and of the congenital and acquired forms that I would draw attention. Since 1931 I have used one or other of these methods instead of malaria.

High frequency currents, when applied to the patient in any of the standard manners, cause heat to be generated within the patient. The vacuum tube circuit generating high frequency current, as in the inductotherm, is said to be superior to the spark gap assembly employed in the usual type of diathermy apparatus. In the use of ordinary diathermy, when the metal electrode is placed next to the skin, there is always some slight danger of burning, as well as the discomfort to the patient caused by the weight of the electrode and the constriction necessary to keep the electrodes in place.

The clinical application of the inductotherm is simpler than that of diathermy. Three turns of insulated cord are placed round the patient's trunk, after the patient's body has been rolled in blankets or sleeping bag. I find that the inductotherm generates heat more rapidly and better than either the ordinary diathermy or any of the so-called short wave appliances of which I have knowledge. I attribute the speedier and more easily controlled heat in the patient to the greater area of patient

enclosed within the active field. The respiration and pulse charts have been of lesser range since the inductotherm was used.

The technique consists in insulating the patient against the loss of heat. This is done by wrapping him first in a terry cloth to absorb moisture, then in a mackintosh sheet, after which he is folded in from seven to nine blankets, only the face and head being left exposed to the air. The current is turned on until the patient's temperature is about 39.4° C. (103° F.). This will take between two and four hours. After the current is turned off the patient's temperature will continue to rise another two, three or more degrees, and in a favourable case will be maintained until the patient is uncovered. If the temperature falls too early, it can be again raised by turning on the current. Individuals react very differently, both as to the rate of rise of the temperature and the height that it reaches after the current has been turned off. On rare occasions the unexpected happens and a temperature of 41.5° and 42.2° C. (107° and 108° F.) will be recorded. On some occasions the symptoms have been alarming, but never fatal. The fever is easily controlled by removing the covering and sponging the patient.

The following is the routine method used by me. The treatment bed is arranged in the following way. Two half mattresses are placed on top of the regular mattress (avoid the use of wire—a wooden bed spring is essential); a six-inch space is allowed between the two mattresses. Number 1 blanket is placed squarely over the mattress; the next five blankets are folded lengthwise; then a rubber sheet, 90 by 270 centimetres (three by nine feet), is spread across the bed on the division; a blanket folded three-corner style is placed at the head of the bed for the shoulders. One large terry sheet is now spread. Before wrapping the patient in this sheet, protect his elbows, ankles, heels and coccyx with absorbent cotton. After the terry sheet is fastened securely, the rubber sheet is then folded around the patient and the shoulder blanket is adjusted; four blankets, folded lengthwise, are then placed on top of the patient, and blanket number 1 is fastened securely with a safety pin, so as to form an "envelope". Three turns of the cable are now wound round the "envelope" and the machine is turned on.

By the way of general preparation, two hours before the commencement of treatment the patient is given a hot bath, soap and water enema, and ten ounces of hot milk or coffee. Also "Sodium Hebaral" (0.6 gramme or six grains) is given two hours before the treatment is commenced.

Pulse, respiration and temperature are recorded every fifteen minutes. A hot drink consisting of glucose 10% in saline solution 0.6% is given freely during treatment. The temperature must be kept about 39.7° C. (103.5° F.) for eight hours; during two of these hours it is between 41° C. (105.8° F.) and 41.2° C. (106.2° F.).⁽⁴⁾ It is not advisable to raise the patient's temperature above 40.5° C. (105° F.) for the first two treatments. During the first treatment the machine is turned off at 39.4° C.

(103° F.); during the second treatment it is turned off at 39.6° C. (103.4° F.); during the third treatment it is turned off at 40° C. (104° F.). Some of the patients seem to acquire a resistance to heat. Morphine, 0.016 gramme (one-quarter of a grain), and hyoscine, 0.65 milligramme (one one-hundredth of a grain), are generally administered when the temperature is about 38.9° C. (102° F.).

It is said that hyoscine should not be given, because of its tendency to check sweating. In my experience morphine alone has proved useless and the hyoscine has apparently not been disadvantageous.

The Amount of Heat Necessary.

Neymann says that a temperature of 41° C. (105.8° F.) is the lethal temperature for the spirochæte, and that a temperature of or above 39.7° C. (103.5° F.) has a debilitating effect upon the same organism.⁽⁴⁾ In man spirochætes are killed by a temperature of 42° C. (107.6° F.) for one hour, or 40° C. (104° F.) for two hours, and temperatures slightly lower and maintained for several hours seriously lower their vitality.⁽⁵⁾

Neymann advised raising the patient's temperature to above 39.7° C. (103.5° F.) for about eight hours. He held that during two of these hours the temperature should be kept between 41° C. (105.8° F.) and 41.1° C. (106° F.) at each session, and that the temperature should not exceed 41.3° C. (106.4° F.).⁽⁶⁾ The number of sessions varied, but were generally eight or ten. Neymann now considers the shorter treatments inadequate, and advises twenty bi-weekly treatments. "In each treatment the temperature to be raised above 103.5° F. for six hours and then increased to 105.8° F. for two hours."⁽⁴⁾

I have seldom given treatments with a temperature of over 39.7° C. (103.5° F.) for one hundred hours and have found that many patients lose the serological reactions of the blood and some of the fluid reactions with shorter treatments. Most patients stand with fortitude, if not pleasure, from ten to fourteen treatments; after this many get a morbid dread of its continuance, though the same patient does not object to a renewal of the treatment after an interval. I also find in many cases a progressive tendency for the pulse to rise out of proportion to the temperature as the number of treatments increases.

The number of hours of hyperpyrexia advocated by those who use electrical machines is greater than the number of hours of hyperpyrexia allowed when malaria is given. Dr. Evan Jones, of Broughton Hall, has kindly lent to me the case notes of 120 patients treated with malaria. The average number of rigors among those whose condition improved and who recovered is eight, varying from five to twelve. In many of these the highest temperature does not reach 41° C. (105.8° F.), the temperature said to be fatal to the spirochæte. At times the temperature rises to 41.5° C. (107° F.) or above. In no case is it long maintained in the neighbour-

hood of 41.1° C. (106° F.). The desired serological changes are brought about in less time by electrical means than by malaria. In many patients these reactions of blood and cerebro-spinal fluid become "negative" during the course of the treatment. In my earlier treatments I endeavoured to record a temperature of 39.7° C. (103.5° F.) for about forty-two hours, as was then advised, in cases treated with malaria. This would be divided into about eight treatments, and many very satisfactory results were obtained. At this time I was guided by clinical results and did not with sufficient care follow the serological findings.

I now take the blood for examination during the course of treatment, and should the reaction become "negative" or be much diminished, the cerebro-spinal fluid is examined. Should the reaction in the fluid have become less pronounced, no more heat is given; otherwise I continue up to seventy or eighty hours.

I consider that indications for ceasing treatment are: (i) Alteration in the patient's mental condition, such as becoming too worried or resistive; this happens seldom. (ii) Rise of pulse out of proportion to temperature; this occasionally occurs after the seventh or eighth treatment. (iii) Repeated sudden rise of temperature with respiratory failure.

Pronounced mental improvement without serological changes should not be taken as an indication for shortening the course of treatment.

Patients Treated.

I have treated with electric heat 67 patients suffering from syphilitic infections; they may be divided into three classes: (i) those suffering from neuro-syphilis, such as general paralysis and taboparesis; (ii) those suffering from congenital infections; (iii) those whose infections were recently acquired.

In the first class there are 52 patients, ten females and 42 males; in the second, seven patients, five females and two males; in the third, eight patients, all male.

The neuro-syphilitic patients treated suffer from all kinds of infection and are of ages ranging from eight years of age (a congenital infection) to over sixty years of age.

There has not been scope for selection. Most patients admitted to hospital have been treated. A few patients of frail health, advanced in age and in dementia, have been rejected. Many of the patients were originally of low mentality, some being of the criminal class and morally deficient. There are but few contraindications to treatment; active or even quiescent tuberculosis and nephritis are about the only ones.

Simpson gives as contraindications to his treatment an age of sixty years and over, cardiac and renal insufficiency, advanced cardio-vascular syphilis, aortic aneurysm and the demented forms of advanced *dementia paralytica*; he states that those of forty-five years of age and onwards need great care.⁽⁷⁾

Neymann has treated patients who have been suffering from arteriosclerosis, diabetes, aortic aneurysm and advanced organic heart disease.⁽⁴⁾

Any tendency to tuberculosis, in my opinion, should be added to the contraindications, as two of my patients have died of this disease within two years of the treatment. In neither case was any sign of this trouble detected before treatment.

One lad, aged fourteen years, who was admitted to hospital with a diagnosis of nephritis, who had an intermittent albuminuria, but whose kidney function was good, received treatments with 83½ hours of hyperpyrexia without any apparent harm resulting to the kidney condition.

Patients with moderate arterial or myocardial degeneration stand the heat well, but of course need care during the early treatments.

The clinical results reported in this paper are, in my opinion, equal to those obtained by treatment with malaria, but are not so good as some recorded by American observers.

The clinical results in 742 cases from various sources collected by Neymann are complete remissions in 212 cases and improvement in 253. Neymann and Osborne record 16 complete remissions in 25 cases. Neymann in his private practice, treating patients in the early stage of the disease, has a recovery rate of between 80% and 90%.⁽⁴⁾

It is a matter of some difficulty to class results. Two patients that in my earlier reports were returned as "much improved" have been readmitted to hospital and three have died, two of intercurrent diseases.

Of the ten female patients, all are still alive. The patients in Cases I, II and III, who were among the earliest, were treated in 1931. Two of the ten were suffering from *tabes dorsalis*. Both improved with treatment, but in neither of these two instances was the treatment thorough. One left, against advice, as soon as she felt a little better. The other was resistive to heat, twice had failure of respiration while under the machine, but left the hospital much improved, having improved in general health. She lost, for the time being, her gastric crises.

Of the eight female general paralytics, five have been discharged from hospital; two of them (Cases II and III) have been out since November, 1931, and one since June, 1933. The other patient (Case XXXII) was discharged in August, 1934. All of these are known to be well and have taken up their former activities.

In Case XXXII the patient was morally deficient before admission to hospital, suffered from kleptomania, had often been in trouble with the police and led an irregular life. A change in her character is said to have taken place when she was sixteen years of age, following an attack of encephalitis.

In Case XX the patient returned after twelve months' absence. Outside her disability was an absolute incapacity to live at peace with her neighbours. In the hospital she is quiet, good and industrious, and apparently well.

One patient, number 18, who made some improvement after treatment, is now advanced in dementia.

The other two are quite quiescent. In Case I the first patient treated, from being dull, apathetic and lazy, has become bright and a useful worker, and has developed a keen sense of humour. Her symptoms have been quiescent for five years and she is often allowed to go on leave of absence.

Of the 39 male patients suffering from general paralysis who have been treated, 16 have been discharged from hospital and classed as "much improved"; but unfortunately three have died, one of general paralysis and two of intercurrent trouble. Three have been readmitted; one of these patients was Case XXXVIII.

This patient had remained well for eight months, then became suspicious and irritable, with vague ideas of persecution. After a second course of treatment he was again discharged, apparently well. He was originally of poor mentality, with a bad family history.

CASE XXXIX.—In this instance the patient did very well after his first treatment and left the hospital immediately after its termination, with a promise to report for further attention, which promise was not fulfilled. He returned after fourteen months in a very shaky and tremulous state, and was depressed, originally having been exalted. After a course of "Tryparsamide" and 64½ hours of pyrexia he again made considerable improvement, both mentally and physically, and completely passed out of his tremulous condition. He now appears quiescent, with some dementia, but is bright and useful.

CASE XXXVII.—In this instance the patient's condition improved rapidly and he left the hospital a month after treatment. After nine months he was again readmitted. He was tremulous, of faulty habits and was apparently advanced in dementia. While at home he and his sons were unable to obtain work, and his wife, following a head injury, was admitted to a mental hospital. These worries may have contributed to his relapse. On this second admission he was given an injection of blood from a patient suffering from malaria, and died from epileptiform convulsions while incubating for the disease.

CASE XVI.—The patient on admission to hospital was maniacal, confused and grandiose. He received diathermy, made great improvement and returned to his work as a clerk within eight months of admission. A few months later he returned to the hospital, confused and tremulous, and shortly afterwards died of general paralysis.

CASE X.—The patient, who made a good mental recovery, died four years after treatment, from Charcot's disease, which had apparently developed while he was under treatment. The joint ankylosed and remained quiescent for four years; during this time he was quite well mentally. Shortly before his death the bone necrosed, and the necrosis was followed by septic infection.

CASE XI.—The patient had diathermy in September, 1931, left the hospital on leave in April, 1932, returned in July of the same year, depressed and in poor health, and died in November, 1933, of pulmonary tuberculosis.

Twenty-two patients have improved, some very considerably, having changed from a vegetative state to become active and interested members of the community. If they were in better circumstances several of these could be discharged from hospital. Among the twenty-two are five of the earliest patients, and they have already outlived the length of time allotted to a general paralytic.

Two of these have since died, one (Case XIII) of tuberculosis, two years and three months after treatment. In Case XIV the patient died of general paralysis eighteen months after treatment, but in

the interval he had learned and become proficient at a new trade, that of a book-binder.

Nine patients have received little, if any, benefit from treatment, and all have died. One patient (Case V) died of acute lobar pneumonia two months after the termination of the treatment. Three died of epileptiform convulsions, two having suffered from these attacks prior to their admission to hospital.

The total number of deaths among male patients is thirteen. Four of these patients had shown considerable mental improvement, had been discharged from hospital, and were later readmitted. The interval between death and the termination of the heat treatment varied from two months in Case V (the patient died of lobar pneumonia) to four years and four months in Case X; in the other cases the interval ranged from one year and two months to four years and three months. The average period of survival of those who have died since treatment is two years and nine months, the average number of deaths within five years of treatment being 25%.

The general paralytics admitted to this hospital are mostly advanced and neglected—two suffered from acute and rapid infections. The amount of bodily enfeeblement and apparent dementia does not entirely contraindicate treatment. In Cases XLIV and XLV the patients were both thin, miserable and bed-ridden, and could not feed themselves or converse at the time when treatment was commenced. They both did well, more especially the former, who is now an active, energetic worker.

The results of the treatment of the forty-nine neuro-syphilitics can, I believe, be classified as follows:

Much improved	21 (40.3%)
Improved	22 (42.1%)
Unimproved	9 (17.1%)

Of the total, thirteen, or 25%, have died within five years of treatment.

Serological Reactions.

Before and after treatment examinations were made of the blood and/or cerebro-spinal fluid of three classes of patients—adults suffering from neuro-syphilis, patients suffering from congenital syphilis and patients with recent infections; the results are available in forty-six cases.

The records of thirty-one of the adult neuro-syphilitics have been kept, and in some few cases records have again been made after a few years' interval. Unfortunately some of the patients who did well from a clinical standpoint left the hospital before a second examination was made. I was not then aware that such rapid serological changes as sometimes occur could take place. Lately I have endeavoured to make these changes an indication of the length of treatment.

Table I shows these alterations; they are not constant, nor do those of the fluid and blood run parallel. With more knowledge as to the amount of heat to be given and its judicious combination with other treatment, better serological results

could doubtless be obtained. In fact, with this knowledge it is reasonable to hope that in all cases the blood and fluid may be rendered normal with a few months' treatment.

The blood changes of 28 patients have been recorded; the changes in the fluid of 30; the changes in both blood and fluid in the same individual 27 times.

The reaction of the blood to the Wassermann test has changed from positive to "negative" in thirteen cases, from positive to partly positive four times, and has remained positive in nine cases. The reaction of the cerebro-spinal fluid to the Wassermann test has changed from positive to "negative" nine times, from positive to slightly positive in five cases, and has remained unchanged fourteen times.

In the same person both the blood and fluid have changed to "negative" or part "negative" nine times. In eight cases both have given a positive reaction after treatment, and in five other cases the blood has given no reaction and the fluid has remained positive or part positive. The blood change seems to antedate that of the fluid. In only one instance (Case XX) did the fluid become "negative" and the blood remain part or slight positive.

Nineteen records of the Kline test were available; in six cases the response was a change from positive to negative, a partial change occurred in eight, and the response was unchanged five times.

The most consistent of the changes in the cerebro-spinal fluid, other than the change in response to the Wassermann test, already dealt with, is the alteration in the cell count, which, if abnormally high (this is unusual), almost invariably falls within normal limits. Dr. Brothers, Dr. Farran-Ridge and Dr. Sanderson, in their very illuminating paper on malarial therapy and serological reactions, regard the cell count as the most valuable of all cerebro-spinal fluid tests as a guide to treatment.⁽⁸⁾

The colloidal gold curve is usually reduced. In nine cases it became completely normal and in fifteen very much reduced. In three cases it has fluctuated, dropping and again becoming higher. In Case XLII it was very erratic, going up after treatment and again falling and rising after an interval of some months. In Case XLI, in which the patient had apparently clinically recovered, it remained at 5555551000 six months after he had been discharged from hospital. In Cases XXXVII and XXXIX both patients had left the hospital "much improved" and without their fluid being reexamined; they relapsed and returned after intervals of 21 and 17 months respectively. On their readmission the gold curves read at 555555510 and 5555540000, in each case being near the original reading. I think that a patient who is discharged from hospital with a high gold curve, although he may be clinically well, is in danger of a relapse, that he should be under constant observation and treated with drugs, and, if the gold curve does not fall, that he should have a second course of heat.

Alterations in the results of the globulin and Takata Ara tests are not so often brought about.

TABLE I.
Neurosyphilis.

Case.	Sex.	Age.	Type.	Time of Observation.	Blood.		Cerebro-spinal Fluid.				Gold Curve.	
					Wassermann.	Kline.	Boas.	Wassermann.	Cells.	Globulin.		Takata Atn.
I	F.	40	Tubo parous.	Before treatment, June, 1931. After 7 diathermy treatments, 48 hours above 103.5° F. January, 1936, no further treatment.	Negative. Negative. Negative.				2	Positive. Negative. Negative.	Positive. Negative. Negative.	1311000000 Negative. Negative.
II	F.	32	Melancholic general paralysis.	7 diathermy treatments, November, 1931. After treatment, January, 1932.	Negative. Positive.				70	Positive. Positive.	Positive. Positive.	5555554100 Positive. Positive.
III	F.	33	Exalted general paralysis.	Before treatment, September, 1931. After 7 diathermy treatments, 40 hours above 103.5° F. Before treatment, May, 1931.	Positive.	+4			15	Positive. Positive.	Positive. Positive.	2443210000 Positive. Positive.
IV	M.	45	Dementia general.	After 10 diathermy treatments, 61½ hours above 103.5° F. Before treatment, July, 1931.	Positive.				2	Positive. Positive.	Positive. Positive.	4444211000 Positive. Positive.
V	M.	50	Dementia general.	After 10 diathermy treatments, 61½ hours above 103.5° F. Before treatment, September, 1931.	Positive.	+3			45	Positive. Positive.	Positive. Positive.	2421100000 Positive. Positive.
VII	M.	50	Dementia general.	After 10 diathermy treatments, 61½ hours above 103.5° F. Before treatment, September, 1931.	Positive.	+4			NIL.	Positive. Positive.	Positive. Positive.	3444321000 Positive. Positive.
VIII	M.	50	Dementia general.	After 11 diathermy treatments, 64 hours above 103.5° F. Before treatment, November, 1931.	Negative.	+2			11	Part pos. Positive.	Slightly positive. Positive.	0001210000 Slightly positive. Positive.
IX	M.	45	Exalted general paralysis.	After 8 diathermy treatments, 46½ hours above 103.5° F. Before treatment, September, 1931.	Positive.	+1			130	Positive. Positive.	Positive. Positive.	4444444390 Positive. Positive.
X	M.	42	Melancholic general paralysis.	After 9 diathermy treatments, 33½ hours above 103.5° F. Before treatment, October, 1931.	Negative.				40	Positive. Positive.	Positive. Positive.	4444431000 Positive. Positive.
XI	M.	48	Exalted general paralysis.	After 9 diathermy treatments, 33½ hours above 103.5° F. Before treatment, July, 1932.	Negative.	+1			NIL.	Slightly positive. Positive.	Slightly positive. Positive.	0910110000 Slightly positive. Positive.
XII	M.	34	Melancholic general paralysis.	After 9 diathermy treatments, 40½ hours above 103.5° F. Before treatment, March, 1931.	Positive.	+2			4	Positive. Positive.	Positive. Positive.	3444443321 Positive. Positive.
XIII	M.	46	Exalted.	After 9 diathermy treatments, 41½ hours above 103.5° F. Before treatment, March, 1931.	Negative.	+1			70	Slightly positive. Positive.	Slightly positive. Positive.	0011000000 Positive. Positive.
XIV	M.	45	Exalted.	January, 1936, no further treatment. Before treatment, June, 1932.	Slightly positive. Positive.	+2			7	Positive. Positive.	Slightly positive. Positive.	4444431000 Positive. Positive.
XX	F.	38	Dementia.	After 7 diathermy treatments, 28 hours above 103.5° F. Before treatment, February, 1936.	Positive.	+1			4	Positive. Positive.	Slightly positive. Positive.	1944421000 Positive. Positive.
XXII	M.	38	Dementia.	After 7 diathermy treatments, 28 hours above 103.5° F. Before treatment, February, 1936.	Positive.	+2			68	Positive. Positive.	Positive. Positive.	12442310000 Positive. Positive.
XXIII	M.	40	Dementia.	After 7 diathermy treatments, 28 hours above 103.5° F. Before treatment, February, 1936.	Positive.	+2			8	Positive. Positive.	Positive. Positive.	Negative. Negative.
XXVI	F.	38	Dementia.	After 7 diathermy treatments, 28 hours above 103.5° F. Before treatment, February, 1936.	Positive.	+3			NIL.	Negative. Positive.	Negative. Positive.	Negative. Negative.
XXVII	F.	29	Exalted.	After 11 diathermy treatments, April, 1932. February, 1936, no further treatment. Before treatment, October, 1932.	Positive. Negative. Positive.	+2			2	Positive. Positive.	Positive. Positive.	00112100000 Positive. Positive.
XXXII	F.	29	Exalted.	After 9 treatments, 63½ hours above 103.5° F. Before treatment, October, 1932.	Negative.	+2			22	Negative. Positive.	Negative. Positive.	4444444410 Positive. Positive.
XXXIII	M.	33	Dementia.	After 8 treatments, 34½ hours above 103.5° F. Before treatment, October, 1934.	Positive.	+4			2	Positive. Positive.	Positive. Positive.	1344431000 Positive. Positive.
XXXVIII	M.	28	Exalted.	After 12 treatments, 66½ hours above 103.5° F. Before treatment, February, 1936.	Positive.	+1			6	Positive. Positive.	Positive. Positive.	4444444410 Positive. Positive.
XLII	M.	40	Exalted.	Readmitted, February, 1936. After 8 inductotherm treatments, 11½ hours above 103.5° F., and 8 injections "Trypanamide", May, 1936.	Positive. Slightly positive.	+1			22	Positive. Positive.	Positive. Positive.	4444444410 Positive. Positive.
XLIII	M.	44	Exalted.	Before treatment, January, 1935. After 8 inductotherm treatments, 43½ hours, April, 1935. Readmitted, October, 1935.	Positive. Positive. Positive.	+3			40	Positive. Positive.	Positive. Positive.	2443210000 Positive. Positive.
XLIV	M.	32	Dementia.	After 5 further treatments. Before treatment, June, 1935. Before treatment, October, 1935.	Positive. Positive. Positive.	+2			9	Positive. Positive.	Positive. Positive.	5555554100 Positive. Positive.
XLVI	M.	33	Exalted.	Before treatment, October, 1935. After 10 inductotherm treatments, 57 hours, January, 1936.	Negative.	+4			8	Positive. Negative.	Positive. Negative.	5555554100 Positive. Negative.
XLVII	M.	29	Melancholic.	Before treatment, October, 1935. After 8 inductotherm treatments, January, 1936. After 6 injections "Trypanamide".	Positive. Positive. Positive.	+3 +1 +1			24 2 2	Positive. Slightly positive. Positive.	Positive. Slightly positive. Positive.	5555443210 Positive. Positive.
XLVIII	M.	29	Melancholic.	Before treatment, January, 1936. After 8 inductotherm treatments, 55½ hours, February, 1936.	Positive. Positive.	+2 +2			65 3	Positive. Positive.	Positive. Positive.	5555443210 Positive. Positive.

TABLE I.—Continued.
Neurosyphilis.—Continued.

Case.	Sex.	Age.	Type.	Time of Observation.	Blood.			Cerebro-spinal Fluid.			Gold Curve.	
					Wassermann.	Kline.	Boas.	Wassermann.	Cells.	Globulin.		Takata Am.
XLVIII	M.	60	Exalted.	Before treatment, July, 1935. After 5 inductotherm treatments, 27½ hours, September, 1935.	Positive.	+4	Positive.	Slightly positive.	42	Positive.	Positive.	12531000000
XXXV	M.	49	Dementia.	Before treatment, April, 1934. After 9 diathermic treatments, 39 hours, June, 1934.	Positive.	+4	Positive.	Slightly positive.	22	Positive.	Positive.	555554200
XLI	M.	41	Confused.	Before treatment, January, 1936, no further treatments.	Positive.	+4	Positive.	Positive.	4	Positive.	Positive.	5521000000
LI	M.	36	Exalted.	Before treatment, May, 1936. After 7 injections "Trypsinamide". Part pos.	Positive.	+1	Positive.	Positive.	5	Negative.	Negative.	0011000000
LIV	M.	36	Exalted.	Before treatment, May, 1936. After 7 injections "Trypsinamide". Part pos.	Positive.	+2	Positive.	Positive.	18	Positive.	Positive.	2455510000
LIX	M.	33	Confused.	Before treatment, September, 1935. After 8 inductotherm treatments, 40½ hours with "Methanol", 2 injections, October, 1936.	Negative.	+4	Negative.	Positive.	3	Positive.	Positive.	5555532100
LV	M.	45	Exalted.	Before treatment, October, 1936. After 48½ hours above 103.5° F. After 17 treatments, 96 hours above 103.5° F. 11 injections "Methanol". 3 injections "Neoklasidiaz".	Positive.	+4	Positive.	Positive.	21	Positive.	Slightly positive.	545421000
					Positive.	+4	Positive.	Slightly positive.	23	Positive.	Positive.	5555542100
					Positive.	+4	Positive.	Positive.	231	Positive.	Slightly positive.	4422100000
					Positive.	+3	Positive.	Positive.		Slightly positive.	Positive.	5555534100

The two usually change together, though twice the result of the Takata Ara test has remained positive when that of the globulin test has become negative. In twenty-eight cases I have records of these reactions. The result of the globulin test became negative eight times, slightly positive nine times, and remained unchanged eleven times. The Takata Ara test gave negative results eight times, slightly positive results seven times, and remained unchanged thirteen times.

"An increased percentage of protein in the cerebro-spinal fluid is usually the last of all abnormal findings to disappear."⁽⁸⁾

I would suggest that the irregularity of the serological results may depend upon the length of time that elapses between the termination of the treatment and the examination of the second specimens. More favourable changes have been noted in the fluid after a prolonged interval in two cases of the series, namely, Cases XV and XXXV.

The amount of antiseptic treatment given before or after the pyrexia is induced may have some bearing upon the matter. Insufficient treatment with heat may be the cause of some of the reactions remaining unchanged. In Case XLIV a "+4" response to the Kline test became negative after an additional thirty-one hours of hyperpyrexia. In Case XLII the gold curve diminished after a second series of treatments.

Favourable serological changes and good clinical results do not always run parallel. For example, in Cases II, III, IX and XLIII, in which the patients retained positive reactions, they have made excellent recoveries and have returned to their homes and usual modes of life. In Cases II and III the patients have been well for four years.

In Cases XV, XXIII, XXVI and XLIV the results of the tests have become completely negative, the patients all show a considerable amount of dementia, and all, except the patient in Case XXIII, who is totally demented and frail, are well physically and mental symptoms are quiescent. The want of more decided mental improvement in these four patients, it may be assumed, is due to irreparable damage to the central nervous system before treatment.

Case XLII is of interest because of the variations in the gold curve.

The patient was an habitual criminal. On his admission to hospital the blood Wassermann test gave a positive reaction, the Kline test gave a "+4" response, the cerebro-spinal fluid gave a positive reaction to the Wassermann test, the gold curve was 244321000, and the cell count was 40. After eight treatments with 45½ hours of hyperpyrexia, the gold curve rose to 54521110 and the cell count dropped to 9, other reactions remaining as before. The patient made much mental improvement and was returned to gaol. After one month he had assumed these so as to be readmitted to hospital. The subsequent course of the case falsified the patient's statement. The colloidal gold curve was 5555500000. He was submitted to another thirty-one hours of pyrexia, after which the gold curve read 2532541000. The other reactions were unaltered, except the response to the Kline test, which was originally "+4" and became "+2".

CASE XLIII.—The patient was a relative by marriage of patient XLII; he also had a criminal history. The gold curve was unaltered after nine treatments with 57½ hours above 39·4° C. (103° F.), although the response to the Wassermann test in both fluid and blood became negative. He made a good and quick clinical recovery, was discharged from hospital, and is probably following with success his life of crime.

It could not be ascertained in Cases XLII and XLIII whether the patients contracted their disease from the same source; both denied any knowledge of infection.

CASE XLV.—A man, aged thirty-two years, when admitted to hospital was apparently in an advanced condition of dementia. He was grossly tremulous, incoherent and unintelligible. After admission he continued to lose ground, became practically stuporose, could not stand, walk or feed himself, and had retention of urine. His speech could not be understood. After being treated with "Sulpharsphenamine" and potassium iodide and mercury he was treated with heat; he was given ten treatments with a total of 57½ hours above 39·4° C. (103° F.). While under treatment his weight went down to 44·1 kilograms (seven stone), that is, he lost 23·4 kilograms (fifty-two pounds). A month later he gained 12·6 kilograms (two stone), was an active worker in the garden, and could talk coherently, although his speech remained slurred. Before treatment the blood reacted to both the Wassermann and the Boas tests, and the Kline test gave a "+ 4" response. All the fluid tests gave positive results, and the gold curve was 5535113000. After treatment these blood and fluid reactions were reversed and became completely normal.

Congenital Syphilis.

We have treated with heat seven patients who suffered from congenital syphilis. Four of these suffered from congenital general paralysis, as demonstrated by their spinal fluid reactions. One was reported to have recently become mentally dull, self-centred and uninterested in her surroundings and had the appearance and characteristics of an early hebephrenic dementia praecox. The sixth patient was without mental symptoms and was sent for heat treatment because of his resistance to all other anti-specific measures. Six of these patients had been thoroughly treated by orthodox means before admission to hospital, this treatment in some of the cases extending over ten or more years. This doubtless greatly influenced the favourable results obtained. The following are the histories of two typical cases.

CASE XLIV.—A girl, aged twenty-two years, was a congenital syphilitic. Before developing symptoms of paralytic dementia she had for three years been thoroughly treated for specific chorioiditis. Her mental symptoms occurred suddenly, with vomiting and headache, and she became semiconscious. On admission to hospital she was extremely restive, could not converse or answer questions, was faulty in habits, and quite unconscious of her surroundings, and had to be tube fed. She was unable to stand or walk. At this time her blood and fluid reactions were completely positive, the gold curve being 5554310000. After fourteen treatments with eighty hours above 39·4° C. (103° F.) her blood was reexamined. The Wassermann and Boas tests yielded no reactions, and the response to the Kline test had changed from "+ 2" to "+ 4". Treatment was continued for an additional thirty hours at a temperature above 39·4° C. (103° F.), after which the fluid and blood reactions were completely "negative". After the treatment the patient gained much in weight, putting on 18·9 kilograms (three stone) within four months. She became able to sit up and to walk with aid, could recognize persons by

voices and could answer questions and say short sentences. She has continued to make some improvement for some months since the treatment was discontinued, has become more conscious of her surroundings and improved in her powers of progression, but cannot walk alone. She has some control over the sphincters. Gradual and very slow improvement continues, and it is now twelve months since the treatment finished.

CASE LXV.—A female patient was sixteen years of age. Her father had died at Callan Park of general paralysis of insane in February, 1931. For three years she had been under treatment at the Royal Prince Alfred Hospital, and for one year at the Royal North Shore Hospital. On admission she was found to be an imbecile child, unable to read or write. She was in a condition of subacute mania, constantly excited and restless, and was emotional and uncontrollable. The pupils were dilated and fixed. The blood gave a positive reaction to the Wassermann test, the reaction to the Kline test was "+ 3", and to the Boas test "+ 4". The cerebro-spinal fluid reacted to the Wassermann test, it contained no cells, the reaction of the fluid to the globulin test was positive, the Takata Ara test gave no reaction, and the gold curve was 5555432100. She received eleven treatments, with a temperature above 39·7° (103·5° F.), for seventy-seven and a quarter hours. After the tenth treatment her blood and fluid were found to yield no reactions. She lost all her maniacal symptoms after the first treatment and improved mentally throughout; she is now well behaved, biddable and helpful, and a very different girl from what she was on admission. Her vision was very defective, and she was examined by Dr. Berge in August, 1936. He reported the vision of right eye to be $\frac{1}{20}$, and of the left nil. Both fundi were very pale. The right optic disk was pale on the temporal side. In the left eye complete optic atrophy was present. After the completion of the treatment it was found that the patient had recovered some sight in the left eye, being able to discern objects. Dr. Temple Smith kindly examined the patient in January, 1937, and reported vision of right eye to be $\frac{1}{20}$, and of left $\frac{1}{20}$; this result was the same as he obtained when he examined her in November, 1935; he found on both occasions that double optic atrophy was present. This raises some doubt as to whether the patient was blind in August.

Cases of Recent Infection.

If the serological changes already described can be brought about in chronic cases of neuro-syphilis and in those of congenital origin, it seems reasonable to expect that early cases of syphilis will be more easily influenced.

Neymann, Lawless and Osborne have recently published a paper on "The Treatment of Early Syphilis with Electro-pyrexia", which goes extensively into the subject and which brings the results of treatment and observation up to date. They point out that local syphilitic lesions can be treated by local heat and the spirochaetes destroyed. They have collected records of forty-seven patients treated solely by hyperpyrexia, and state that alone it cannot cure the disease.

Neymann and his co-authors describe seven patients treated by them with heat and injections of arsenic and bismuth. In all, the active symptoms disappeared very shortly. They have all remained free from clinical and serological changes for from five to eighteen months. With two to nine periods of heat and from two injections of an arsenic preparation and two of bismuth to a total of nine injections, the response to serological tests became negative in from 18 to 68 days of treatment. After the first period of hyperpyrexia no spirochetes could be obtained from the chancre.

In the summary of their paper they state:

The average length of treatment necessary to obtain a negative serological reaction can be materially shortened by combined therapy.

In their series the average was forty-two days.

Spirochæta pallida found in human syphilitic skin lesions is destroyed by temperature of 105.8° F. maintained for two hours. The same organism found in lymph glands is destroyed by longer or higher temperatures ranging above 105.8° F. for five or more hours and above 107.6° F. for one of these hours.

It is probable that the syphilitic virus can be eradicated from all parts of the human body by the simultaneous use of high fever, arsphenamine and bismuth compounds.

The entire therapy presupposes an organized staff trained in giving hyperpyrexia treatment.⁽⁹⁾

I have treated eight patients suffering from early syphilis, that is, with primary sores or quite early secondaries. I have also treated one patient whose infection was of about seven months' duration with, at the time, no active symptoms, but whose blood gave positive reactions after a period of treatment with arsenic and mercury. Several typical histories are as follow.

CASE LVIII.—The patient had a chancre and macular rash and inflamed tonsils. His blood reacted to the Wassermann test and the Boas test, the reaction to the Kline test was "+ 4". He was given no arsenic or mercury before the heat was applied. For twenty-seven hours the temperature was kept above 39.7° C. (103.5° F.), the Kline reaction dropped to "+ 1". After a further twenty-two hours the Wassermann test gave a partly positive reaction and the Kline and Boas tests gave no reaction and the physical signs had quite cleared up. He was then given two injections of "Sulpharsphenamine", 0.45 gramme. Immediately after the second injection all tests produced no reactions. Six months later, with no further treatment, the tests still produced no reactions.

CASE XL.—The patient was admitted to hospital with a chancre. The blood reacted to both the Wassermann and Boas tests and the response to the Kline test was "+ 4". He was given two injections of "Sulpharsphenamine" of 0.45 gramme followed by heat. He was most resistant to treatment, but after four treatments of twenty-seven and a half hours at a temperature above 39.7° C. (103.5° F.) the results of the Wassermann and Boas tests had each become partially positive and the reaction to the Kline test was "+ 2". Six months later, without further treatment, his blood was completely normal.

CASE LXII.—A lad, aged twenty years, was admitted to hospital with a deep ulcerating chancre and an enlarged iliac gland. He had been given two injections of "Sulpharsphenamine" before admission. On his admission the blood Wassermann and the Boas reaction were positive; the response to the Kline test was "+ 2". He was treated with four treatments of inductothermy and three of diathermy with a total of thirty-five and three-quarter hours above 39.7° C. (103.5° F.), after which his blood and cerebrospinal fluid were both completely normal.

Action of Heat.

It is not clear by what means heat brings about its beneficent action in specific cases. "Simple fever production is the one common factor to the great variety of agencies employed as substitutes for malaria therapy."⁽⁷⁾ That heat alone can destroy the spirochætes has been proved. Infected emulsions of rabbit testicles are destroyed at a constant temperature of 42° C. (107.6° F.) for one hour, or 41° C. (104.9° F.) at two hours.⁽²⁰⁾

Besseman and Thiry have shown that in man spirochætes are killed at tissue temperature of 42° C.

¹In Neymann's article the word "not" appears before "destroyed", but as this is obviously wrong I have omitted it.

(107.6° F.) for one hour or at 40.5° C. (104.9° F.) for two hours, and that temperatures a little lower seriously affect their vitality, when maintained for some length of time.⁽⁶⁾ Bessemans has also shown that orchitic primary syphilis of the rabbit is cured by a tissue temperature of 40.5° C. (104.9° F.) for one hour. After being exposed to such heat the spirochætes become immobile and disappear in a few days. Heating the testicles of rabbits at 40.5° C. (104.9° F.) for two hours after infection prevents the appearance of the primary lesion.⁽²¹⁾

Carpenter, Bock and Warren prevented the development of chancres in twenty-one out of twenty-five rabbits in which treatment was begun five to seven days after inoculation.⁽²⁰⁾

Dr. Oliver Latham, quoting from Bahr and Bruetsch, has informed me "that malaria causes some disturbance of the smallest blood vessels, so that the blood serum and syphilitic antibodies can get from the vessels into the parenchyma to the nerve cells and spirochætes. The spirochætes act by narrowing the blood vessels and thickening their adventitia. Open up the blood vessels and clinical improvement must ensue."⁽²²⁾

Neymann attributes the clinical improvement to destruction of the spirochæte and response of the reticulo-endothelial system and general vasodilatation.

Heat of itself can hardly be the only factor in bringing about improvement after malaria and electropyræxia, as the antisyphilitic process is often continuous and progressive for many months. The Wassermann and other specific reactions will continue to become less intense over a period of two years or more, even though the patient may not have received treatment during this time. The direct results of heat cannot be effective over such a long period.

Bruetsch believes that the results obtained with malaria in general paralysis are due to reactivation of the reticulo-endothelium.⁽²⁴⁾

S. M. Davidson writes:

The congo-red test in general paralysis demonstrates a definite hypofunction of the reticulo-endothelial system and an improvement following malaria therapy.

He points out that malaria, typhoid and relapsing fever will all cause fever, swelling of the spleen and a definite or relative leucopenia. He lays stress upon the leucopenia and the mechanism of the leucopenia in bringing about good results. He suggests that reticulo-endothelial dystonia may be the cause of the development of general paralysis by some syphilitics.

Discussion.

It is not as yet possible to make exact comparison between the results of treatment by electrical pyrexia with those produced by malaria. Malaria has been in use all over the world for nearly twenty years, electrical pyrexia only since 1929, and not to a great extent anywhere but in the United States of America.

At Horton there is a centre for the treatment of the general paralytics in the London County Council

Mental Hospitals. The medical superintendent of Horton has compared the records of 113 men admitted between 1912 and 1914 with those of an equal number admitted after 1932. The report shows that before modern treatment there was no recovery rate, the death rate was 86.8%, and the discharge rate 3.4%. An equal number treated since 1932 show a treatment rate of 85% with a discharge rate of 19.8%, the death rate being reduced to 40%.

The best results recorded indicate that of all patients admitted to hospital, malarial therapy can yield a recovery rate of 25% and a death rate of 30%.⁽¹⁰⁾

G. de Rudolf sums up the results of malaria treatment in his article "Recent Advances in Therapeutic Malaria". As there is much to be learned from this paper, I hope for forgiveness if I extract from it somewhat freely. Quoting from Meagher, of 404 treated patients, observed for two years, he gives a recovery rate of 21.5% and a death rate of 36.9%. The recovery figures mentioned by de Rudolf vary greatly with different authors, and there is a higher rate when patients are treated with malaria and arsenic than with malaria alone.⁽¹¹⁾

Neymann, writing of electrical methods, gives a recovery rate of 212 among 742 patients, collected from various sources.⁽⁴⁾ Whatever method is used, the results must largely depend upon circumstances beyond control, such as date of infection, the length of time the nervous symptoms have been present and the progress made in that time, the amount of previous treatment, the physical condition of the patient and perhaps the strain of spirochæte.

Meagher, quoting from figures for England and Wales, found from 1,532 patients a death rate within the first two months of 7.3% among those who were treated. Among 286 patients he found a death rate of 41.9% within three years.⁽¹²⁾ I am not aware of any published figures giving a death rate of general paralytics within a given time, when treated with electrical pyrexia. Neymann⁽⁴⁾ records eighteen deaths occurring among the 742 collected cases as the direct result of treatment, approximately 2%. Giles records the death rate as 1% or less in induced fever by physical measures.⁽¹³⁾ The death rate among those treated by myself within five years is fairly high among the male patients, namely, 31%, but when the females are included this is reduced to 25.5%. Either figure compares favourably with the death rate of those treated with malaria.

de Rudolf gives the death rate of 624 untreated patients at the end of three years as 89.8%.⁽⁶⁾ Dr. Evan Jones has shown⁽¹⁴⁾ that in pre-malaria days the average length of life of a male general paralytic after his admission to hospital was eleven months. This indicates that either form of treatment greatly reduces the mortality.

Electrical pyrexia seems to bring about change in the serological reactions in much shorter time than does malaria.

Dr. Farran-Ridge, of Melbourne, who has done much work upon this subject,⁽¹⁵⁾ informs me that in a case of true general paralysis it takes from

two to three years for response of the blood to change from positive to negative, after malaria has been induced. In the meningo-vascular type it takes from six to nine months. In the primary case, treated with malaria by Brothers and Farran-Ridge, it took ten months for response of the Wassermann test to become "negative".⁽⁹⁾

Among our cases there are failures to produce any changes in the blood or fluid. In many cases, also, serological reactions of lesser intensity have been estimated before the termination of the treatment, the results of several becoming completely negative immediately after periods of hyperpyrexia varying from thirty to one hundred hours. The time occupied by the treatment was a matter of a few weeks. The response of the blood, in a case of recent infection treated with heat and drugs, changed from positive to negative in twenty-three days from the commencement of treatment.

In Case XLIV (Table II) after ten weeks' treatment the fully positive response of the blood and cerebro-spinal fluid became fully negative. The same occurred in Case LXV (Table II) after five weeks' treatment. Included in each of these cases was a previous high Lange curve, which, during the course of treatment, became negative. Also might be mentioned Cases XXIII, XXVI, XXXII and XLIV, in which the reactions changed immediately after a course of bi-weekly treatments, continuing from five to ten weeks.

That the action is sustained and progressive, as in post-malarial cases, is illustrated by Cases I, XV, XX and XXVI (Table I), in which blood and cerebro-spinal fluid were reexamined four years or more after treatment. In Case XV there is a progressive improvement, in that after nearly five years' interval, the response of the blood and cerebro-spinal fluid to the Wassermann test, which was previously slightly positive, had become negative. In the other three cases the response had remained negative. In Cases XXXVIII and XLII, in which the patients were both treated with inductothermy, there was a very erratic Lange curve. In Case XXXVIII (Table I), after fifty-six and a half hours of heat, this curve drifted from 5433000000 to 1410000000. The patient was discharged and readmitted to hospital some months later, with a Lange curve of 5534421000.

Case XLII (Table I) was even more irregular in this reaction, rising from two to five after a first course of inductothermy, falling again to about the original figures after a further period of thirty-one and a quarter hours' hyperpyrexia and showing rise six months later.

Six of the seven patients with recent infection have changed their blood reactions within two months of the commencement of treatment. In Case LVIII the response of the blood in the Wassermann test became partly positive and the Kline and Boas both negative, with forty-nine hours of hyperpyrexia alone.

Neymann, Lawless and Osborne⁽¹⁶⁾ observed an increase in the intensity of the serological tests after the first heat treatment. They suggest this

TABLE II.
Congenital.

Case.	Sex.	Age.	Type.	Time of Observation.	Blood.		Cerebro-spinal Fluid.				Gold Curve.	
					Wasser- mann.	Kline.	Boas.	Wasser- mann.	Cells.	Globulin.		Takata Ara.
XXV	F.	8	Congenital general paralysis.	On admission, October, 1932. After diathermy, 8 treatments, 40 hours above 103.5° F.	Positive.	+2		Positive.	72	Positive.	Positive.	0004140000 Negative.
XLIV	F.	22	Congenital general paralysis.	On admission. After 13 treatments, 784 hours above 103.5° F.	Positive.	+2	Positive.	Slightly positive.	1	Negative.	Negative.	Negative.
XLIX	M.	15	Congenital, no mental symptoms.	After further treatments, 1114 hours above 103.5° F. Inductothermy— After 43 hours' heat. After 81 hours' heat. After 224 hours' heat. After 834 hours' heat.	Negative.	+4	Negative.	Positive.	2	Negative.	Negative.	5554210000 Negative. Negative.
LXIII	M.	30	Congenital.	Five injections "Trypanamide" Malaria. On admission. Before admission had 10 injections of "Metarsenobismulin" and some mercury. After 494 hours' heat. After 564 hours' heat.	Positive.	+4	Positive.	Negative.		Negative.	Negative.	Negative.
LXIV	F.	17	Congenital, specific.	5 injections of "Methanol". 3 injections of "Neobalsarvan". On admission. Inductothermy, 834 hours' heat.	Slightly positive.	+2	Positive.	Slightly positive.		Negative.	Negative.	Negative.
LXV	F.	16	Congenital general paralysis.	774 hours above 103.5° F. On admission.	Positive.	+1	Negative.	Negative.		Negative.	Negative.	Negative.
LXVI	F.	23	Congenital general paralysis.	On admission. Inductothermy, 13 treatments, 964 hours above 103.5° F.	Negative.	+4	Positive.	Positive.	7	Positive.	Positive.	5554321000 Negative. Negative. Negative.

is due to the sudden death of a number of spirochaetes, the endotoxins being massively liberated.

A change in the serological reactions should be the aim of treatment. Horn states that relapses occur only in patients with a persistent abnormal fluid. If the fluid is positive a year after malarial fever, he advises another course of treatment.⁽¹⁰⁾ Although the mental improvement by no means runs parallel with these reactions, we have patients apparently fully recovered, discharged and earning their living, whose blood and fluid on examination at the time of their discharge differed by little from what it was on admission; for example, Cases XLI and XLIII (Table I). It is possible these reactions may diminish with time or with further treatment if the patient can be persuaded to take it. On the other hand, there are patients whose response of blood tests is fully negative, but who show much dementia; for example, Cases XXIII (Table I) and XLIV (Table II). The latter is more easy to explain than the former, on the supposition of irreparable damage to the nerve centre before treatment. Three patients whom we had discharged and who were, we thought, "much improved" and who after a time were readmitted to hospital, all had on readmission a blood and fluid fully positive, with a gold curve in fives. Two of these had not been reexamined before discharge; in the other patient (Case LVIII) the fluid reactions had increased in intensity between his discharge and readmission.

The first thirty-eight patients in our series were treated with diathermy, the others with inductothermy or inductothermy and diathermy. With diathermy the current passes through the patient, with inductothermy no current passes through the patient, but he becomes the centre of a magnetic field and is heated by oscillations within him. Is there any difference in the action upon the syphilitic process by the heat produced by these two means or by that produced by malaria?

In the earlier cases treated by diathermy the number of treatments given and the hours above 39.7° C. (103.5° F.) were less than when inductothermy was used, but yet the serological findings were more satisfactory when diathermy was used. This applies to the fluid and blood generally, and more especially to the gold curve. Under diathermy, the gold curve always diminished after a course of treatment and the curve of nine patients, of twenty-three examined, became normal. With inductothermy, the gold curve has several times remained high, and twice has risen above the original reading (Cases XL and XLVIII, Table I). As I have pointed out earlier, I consider that these high Lange curves indicate a danger of relapse. On three occasions the figure has fallen from fives to normal—in Case XLV (Table I) and in the congenital cases XLIV and LXV (Table II). In Case LXV the patient had eleven treatments, six of which were with diathermy. The other two patients were treated under the inductothermy machine. In Cases XLIV and LXV the patients had both been treated thoroughly at outside hospitals before receiving heat. The time that has elapsed since

treatment is not sufficiently long to say whether in these inductothermy cases these reactions will gradually improve, as they do up to three years after malaria, nor are the numbers of patients treated sufficiently great to allow any reliable comparison to be made between the two electrical methods.

As diathermy as a means of heat production seems already out of date, I think that its seemingly greater influence on the syphilitic reactions needs serious consideration before it becomes a thing of the past. The patients treated with diathermy (Cases I to XXXV) had originally for the most part lower gold curves than those treated with inductothermy, whose curves were mostly very high. This may be the reason for the difference in the final results. Or it may be that the effects of electrical heat are not due to heat alone, but "to some mysterious electrical action on molecules and atoms", which Dark⁽¹⁷⁾ thinks does not play a part in electrotherapy.

Among the notes upon malaria-treated patients, kindly lent to me by Dr. Jones, I find twenty cases in which the blood or cerebro-spinal fluid has been reexamined shortly after the termination of the rigors. There are in some cases, contrary to expectation, immediate changes in the serological reactions. These examinations have been made within a few days of the last rigor. The reaction of the blood to the Wassermann test has been reported upon eight times. In three cases the response to the Wassermann test remained positive, in four it changed to a partial positive or indefinite negative, once from a partial positive to positive, and in no case did it become completely negative.

In the nineteen Wassermann tests of cerebro-spinal fluid the response was unaltered nine times. This includes two cases in which the fluid was normal before and after the malaria. Once the response of the fluid became completely negative, eight times the response changed to partial or slight positive, and once from an indefinite negative to negative. The gold curve also in some cases showed immediate change. This curve was prepared in twelve cases; in five the curve remained unaltered and in five it was diminished; it was increased once and became completely normal once. The gualacum test replaced the gold test in five cases, in three of which it diminished and in two increased. All the five unaltered gold curves were originally high. There seems a tendency for the high curves, running into several fives, to take longer to fall, whether the patients are treated with malaria or electric heat, although with the electric heat eleven out of thirty-one became normal while the patients were under treatment, and one out of the seventeen in Dr. Jones's post-malarial cases.

There was also much diminution in the cell count in four of Dr. Jones's cases—one from 126 to nil, one from 145 to 17, one from 43 to nil, and another from 38 to nil; once there was a rise from 4 to 21. One of the patients treated with malaria was discharged from hospital and readmitted two years

and four months later. On his readmission the gold curve read as 5555555510, and on his discharge it had been 1343100000—about the same as on his first admission, showing, as in some of our readmissions, an increase in this curve in the interval.

The total number of hours of treatment above a given temperature, whether produced by malaria or other means, does not seem in the majority of cases to have any direct bearing upon the clinical and serological results. With malaria as good results may be obtained with six rigors as with twelve. With the electrical heat I have had good clinical results and have rendered the responses to the serological tests negative by using a temperature above 39.7° C. (103.5° F.) for between forty and fifty hours, and in two cases of recent infection for twenty-eight to thirty-five hours, together with chemotherapy. Examples of this are seen in Cases I, X and XI (Table I), Cases XL and LXII (Table III); in other cases I have failed to bring about the double improvement with hours approximating a hundred.

We read of an occasional general paralytic improving and of his condition remaining quiescent after an injection of malaria, without rigors or fever. Long before the days of Wassermann reactions and fever treatment every mental hospital had what were thought to be quiescent general paralytics, and an occasional one would for a time recover.

In the early nineties there was admitted to Callan Park a general paralytic, with all the expansive and grandiose ideas which characterized the disease more commonly then than now. For no reason he lost all his delusions, was apparently well and returned to his home and work. The improvement was not maintained for many months, for he was readmitted with all his expansive ideas as strong as ever and full of wonder that the things he had imagined, when mad, had all come true.

A typical general paralytic, well in the third stage, demented and with bed sores, had an acute attack of dysentery, in the old days when asylum dysentery was common and severe. After the dysentery he made a remarkable and unexpected recovery and for years afterwards was employed as a gardener.

The condition of others has been known to become quiescent after severe illnesses such as pneumonia and typhoid fever. I looked upon the non-febrile malaria cases as being on a par with the former spontaneous remissions. It is doubtful whether they are greater in numbers than these remissions used to be. Rudolf, however, quoting from Bahr, instances a case of non-febrile malaria, in which there was no mental improvement; about three years later the response of the blood and cerebro-spinal fluid to the Wassermann test had become negative and the gold curve much diminished.⁽¹⁸⁾ Unless this can be explained as following some other treatment, it is inexplicable. These phenomena are rare and can hardly be taken into account in the practical considerations of the disease.

After a course of treatment, the gait, speech and reflexes all improve. In some cases the speech improvement has been very gradual; it may take several months before it approaches normality. An Argyll-Robertson pupil has often become normal.

TABLE III.
Recent Infections.

Case.	Sex.	Age.	Type.	Time of Observation.	Blood.			Cerebro-spinal Fluid.			Gold Curve.
					Wassermann.	Kilne.	Boas.	Wassermann.	Globulin.	Takata Ara.	
LVIII	M.	31	Primary and early secondary.	On admission. Treated with inductothermy— After 27 hours' heat. After 34 hours' heat. After 49 hours' heat. 2 injections "Sulpharsphenamine", 0.45 grammes. Total treatment occupied 29 days.	Positive. Positive. Positive. Part pos. Negative.	+4 +1 +3 Negative. Negative.	Positive. Positive. Positive. Negative. Negative.	Negative.			
LXI	M.	31		On admission. Treated with inductothermy— After 204 hours' heat. After 454 hours' heat. 3 injections "Sulpharsphenamine", 4 months later. No further treatment.	Positive. Positive. Positive. Part pos. Negative.	+4 +3 Negative. +1 +2	Positive. Positive. Positive. Part pos. Negative.	Negative.			
LVI	M.	42	Early secondary.	On admission. 2 injections "Sulpharsphenamine", inductothermy— After 31 hours' heat. After 46 hours' heat. After 604 hours' heat. Total treatment, 49 days.	Positive. Positive. Positive. Part pos. Negative.	+4 +4 +1 +1 Negative.	Positive. Positive. Positive. Negative. Negative.	Negative.			
LVII	M.	25	Early secondary.	On admission. 4 injections "Sulpharsphenamine", inductothermy, 384 hours' heat. Total treatment, 44 days.	Positive. Positive. Negative.	+4 +2 Negative.	Positive. Positive. Negative.	Negative.			
LXII	M.		Primary.	On admission. 2 injections "Sulpharsphenamine", 0.45 grammes. Inductothermy, 354 hours' heat. Total treatment, 23 days.	Positive. Positive. Negative.	+4 +4 Negative.	Positive. Positive. Negative.	Negative.			
XL	M.	18	Primary.	On admission. 2 injections "Sulpharsphenamine", 0.45 grammes. Inductothermy— After 20 hours' heat. After 28 hours' heat. Total treatment, 28 days. 6 months later, no further treatment.	Positive. Positive. Positive. Part pos. Negative.	+4 +4 +2 +2 Negative.	Positive. Positive. Positive. Part pos. Negative.	Negative.			
LX	M.	42	Primary and early secondary.	On admission. Inductothermy— After 42 hours' heat. After 504 hours' heat. 4 injections "Sulpharsphenamine".	Positive. Positive. Positive. Negative.	+4 +4 +3 +1	Positive. Positive. Positive. Indefinitely negative.	Negative.			
				Readmitted 4 months later. After 92 hours' heat and 5 injections of "Muthanol". After a further 104 hours and 0.3 grammes "Neokharisvan". 5 injections "Muthanol". 4 injections "Neokharisvan". Total treatment, 298 days.	Positive. Part pos. Slightly positive. Negative. Negative.	+4 +3 +2 +2 Negative.	Positive. Positive. Positive. Negative. Negative.	Negative.			
LXVII	M.	26	Secondary.	On admission. Before admission had 5 injections of "Neokharisvan" and some mercury. After 12 treatments, 784 hours above 103.5° F. and 11 injections "Muthanol". 3 injections "Neokharisvan".	Slightly positive. Indefinitely negative. Negative.	+2 +1 Negative.	Positive. Negative. Negative.	Indefinitely negative. Negative. Negative.	Negative. Negative. Positive.	Positive. Positive. Negative.	0123410000 Negative.

In Case LXVI double optic atrophy was present. The patient was examined by Dr. Berge; he reported that the sight in the left eye was $\frac{6}{10}$ and that the patient was blind in the other, although he could not detect much difference in the condition of the disks. It was found that after a course of treatment

the patient was able to see objects with the eye previously blind.

Since writing the above I have had the good fortune to read Dr. W. M. Simpson's very illuminating paper, "Artificial Fever Therapy of Syphilis". As Dr. Simpson's methods differ from those in general use, I should like to make some remarks upon the respective procedures.

TABLE IV.
Changes in the Blood Wassermann Reactions in 41 Cases Examined Before and After a Course of Hyperpyrexia.

	Number Examined.	From Positive to No Reaction.	Less Positive.	Unchanged.
Adult Neuro-syphilis	26	13 = 50%	4 = 15.4%	9 = 34.6%
Congenital ..	7	4 = 57%	1	2 = 28%
Acquired ..	8	8 = 100%		
Total ..	41	25 = 61%	5 = 12%	11 = 26.8%

TABLE V.
Changes in the Cerebro-spinal Fluid Wassermann Reaction After Course of Hyperpyrexia.

	Number Examined.	From Positive to No Reaction.	Less Positive.	Unchanged.
Adult Neuro-syphilis	28	9 = 32%	5 = 17%	14 = 50%
Congenital ..	4	2 = 50%	2 = 50%	
Acquired ..	1	1		

Dr. Simpson advocates for neurosyphilis and for early infections a minimum course of fifty hours of fever between 40.5° and 41.1° C. (105° and 106° F.). This is divided into ten weekly treatments of five or more hours' duration. Half an hour before the treatments begin the patient receives an injection of an antisyphilitic drug, and another twenty weekly injections after the termination of the heat sessions. His report is based upon the results obtained in the treatment of 106 patients who have been under observation for from six months to three and a half years. Twenty-six of these are patients with primary or early secondary lesions.

Control patients are treated with heat alone and with drugs alone, and the results are compared with those obtained with the combination of both. Simpson states that either fever therapy alone or chemotherapy alone is often inadequate, but that the combination is distinctly advantageous. Twenty cases of *dementia paralytica* are reported upon; in these the clinical results were good, 70% of patients being socially rehabilitated. The serological findings in these late cases were as shown in Table VI.

longer period of time. In this time the responses to the tests in two cases had become negative, and these showed only part changes at the time treatment was stopped.

The difference in the treatments has been in the relationship of the heat to the administration of drugs. Simpson gives the injections half an hour before putting the patient under the machine. Neymann gives them at the height of the fever. I give a short course of two injections or more before beginning or at the termination of the heat course.

The changes in the blood Wassermann reaction in early cases of syphilis are shown in Table VIII.

With combined therapy Neymann has achieved the maximum result with the minimum of time, heat or drugs, reducing to weeks what had formerly taken years. Of the seven patients recorded by him, three failed to give serological reactions before treatment; these gave reactions during treatment, and all failed to give reactions afterwards.⁽¹⁰⁾

Three of these received injections of "Neoarsphenamine" when the temperature was 41° C. (105.8° F.), two received two injections, and one received one injection. The heat sessions were two,

TABLE VI.

Observation.	Observer.	Number Examined and Found Positive.	Change from Positive to No Reaction.		Reaction Less Positive.		Remained Positive.	
			Number.	Percentage.	Number.	Percentage.	Number.	Percentage.
Blood Wassermann	Simpson	20	4	20.0	9	45.0	7	35.0
	Prior	26	13	50.0	4	15.4	9	34.6
Cerebro-spinal fluid Wassermann	Simpson	20	5	25.0	7	35.0	8	40.0
	Prior	28	9	32.14	5	17.8	14	50.0

The comparison of the changes in the gold curve are shown in Table VII.

TABLE VII.

Observer.	Number Changed to Normal.	Number Reduced.	Number Elevated.	Number Unchanged.
Simpson	—	12	3	5
Prior	8	15	2	4

Twenty-six patients with primary and early syphilis have been treated by Simpson with fifty hours of heat above 40.5° C. (105° F.) and thirty injections of antisyphilitic drugs. Clinically all did well, the symptoms clearing promptly.

The blood Wassermann changes obtained by Simpson, Neymann and myself are compared in Table VIII. The comparison is not altogether reliable, in that the total number of cases treated by Neymann or by me are two-thirds less than Simpson's. Simpson's examinations were made at the end of thirty weeks' treatment; mine over a

three and five respectively. After the heat and "Neoarsphenamine" each patient received two to three injections of bismuth salicylate. The treatments in these three cases, both as regards drugs and heat, have been reduced to the lowest.

The injections of antisyphilitic drugs at the time of acute vascular dilatation as done by Neymann and Simpson, appeals to me as a sound principle and one more likely to lead to good results than giving the drugs before, after or between the heat sessions. But in some of my few primary cases I have, with two injections of "Sulpharsphenamine", given as a short course before or after the heat sessions, obtained results that are comparable with those of Neymann or Simpson.

I should like to point out that if arsenic, which is excreted by the skin, is given when the patient is sweating very freely, the loss may be very rapid.

Simpson states that:

More than 500,000 persons in the United States seek treatment for early syphilis each year. The high cost and inconvenience to the patient often results in inadequate treatment. Any method that would appreciably decrease

TABLE VIII.

Observer.	Number of Cases.	Changes to No Reaction.	Less Positive.	Remained Positive.	Remained No Reaction.	Duration of Treatment.
Simpson	26	14-55.7	10-38.4	1-5.7	1	30 weeks.
Neymann	7	7-100				From 18 to 68 days. Average, 42 days.
Prior	8	8-100				From 23 days to 11 months.

the time and expense involved in providing adequate therapy is worthy of thoughtful consideration. A growing body of evidence appears to indicate that artificial fever therapy fortifies and intensifies the curative action of chemotherapeutic agents.

The Lancet, discussing Simpson's work, states: (19)

The combination of chemotherapy and induced fever in early syphilis has led to rapid clinical and serological improvement. That patients sero-positive have remained negative for years after only thirty weeks' treatment by these means, whereas with chemistry alone treatment commonly continues for two years. The inclusion of all stages of syphilis within the scope of fever therapy opens yet a wider field for the relief of suffering, the reduction of economic loss and the saving of public money. It seems possible that we are at the beginning of a beneficent revolution in the methods of treatment which are wearisome and often unsatisfactory, and it is to be hoped that those with opportunities of having these methods tested will fully and impartially make use of these opportunities.

There remains much work to be done in this field, especially in relation to the amount of heat necessary and the best means of combining the heat with drugs. I anticipate that this will be found to be largely an individual matter, varying considerably with the patient.

If the treatment initiated by Neymann passes the test of time, he will have revolutionized the treatment of syphilis. The time is fast approaching when no patient with syphilis will be considered fully treated unless a course of heat has been given. Then it may be expected that neuro-syphilis and other late manifestations of the disease will disappear, and with the influence of the public health authorities the dread disease itself may be abolished within the next twenty years. Simpson says that "physicians have at their command the means by which to abolish syphilis and gonorrhœa from the face of the earth". (7)

Many treatments for many diseases have been loudly vaunted and have failed to live up to their early promise. I remember when Koch was going to render tuberculosis extinct by means of his preparation. The drug known as "606" has failed to prevent the late manifestations of syphilis. Shortly after the War epilepsy was to be cured by injections of "Colloidal platinum". Many cancer cures have been announced and have been the subject of argument rather than of experiment. Here we have a simple physical agent which requires much further investigation and more time before its true and lasting value can be judged. But Simpson has records of early infections in which the patients have failed to give a Wassermann

reaction for nearly four years, and Neymann has some records extending over more than eighteen months. On these facts it is reasonable to hope much.

Acknowledgements.

I wish to express my thanks to the following: To the Honourable H. P. FitzSimons, M.L.A., Minister for Health, who made it possible for me to carry on this work for nearly twelve months after my retirement. His kindly interest made the purchase of the inductotherm machine possible. To Dr. C. A. Neymann, Associate Professor of Psychiatry, North Western University, Chicago, pioneer of electrical pyrexia in the treatment of disease, for his teachings, which have been invaluable, and for much personal help and advice. To Mr. J. P. Trainor, of Watson and Sons, who first drew my attention to Dr. Neymann's work and who for long periods lent and kept in order the machines that I have used. To the Inspector-General of Mental Hospitals, Dr. Wallace, for permission to use the hospital and for the supply of material. To Dr. Oliver Latham and his staff for the serological work. To the members of the Parramatta Mental Hospital staff, who have given much interest and help, especially those who have done the practical work—Mrs. Ferguson, B.Sc., Nurse Stormoth, attendants Hellier and Jenkins. To Miss D. Dwyer, for much trouble and help in typing the paper.

References.

- (1) C. A. Neymann and Osborne: "The Treatment of Dementia Paralytica with Hyperpyrexia produced by Diathermy."
- (2) E. Dark: "Diathermy in General Practice", Second Edition, pages 161 and 169.
- (3) A. U. Desjardins, L. G. Stuhler and W. C. Popp: "Fever Therapy for Gonococcal Infections", *The Journal of the American Medical Association*, February 29, 1936, page 690.
- (4) C. A. Neymann: "The Treatment of Disease by Means of Electropyræxia", *Proceedings of the Royal Society of Medicine*, Volume XXIX, April 30, 1936, pages 153 to 169.
- (5) A. E. Bessemans and U. Thiry: "Nouveaux essais d'application de la thermothérapie locale au traitement de la syphilis primaire et secondaire chez l'homme", *Bruzelles-médicales*, January 15, 1933, page 322.
- (6) C. A. Neymann: Letter, October 31, 1932.
- (7) W. W. Simpson: "Artificial Fever Therapy of Syphilis", *The Journal of the American Medical Association*, December 28, Volume CV, Number 26, 1935, page 2134.
- (8) C. R. D. Brothers, C. Farran-Ridge and S. Gunderson: "Neuro-Syphilis, with Special Reference to the Vernes Test", *THE MEDICAL JOURNAL OF AUSTRALIA*, May 2, 1936, page 592.
- (9) C. A. Neymann, T. K. Lawless and S. L. Osborne: "The Treatment of Early Syphilis with Electropyræxia", *The Journal of the American Medical Association*, Volume CVII, July 18, 1936, page 194.
- (10) "The L.C.C. Mental Hospitals and General Paralysis of Insane", *The Lancet*, August 8, 1936, page 524.
- (11) G. de Rudolf: "Recent Advances in Therapeutic Malaria", *The Journal of Neurology and Psychopathology*, January, 1936, pages 232 to 254.
- (12) E. T. Meagher: "General Paralysis and its Treatment by Induced Malaria."

⁽⁹²⁾ Giles, Upton: "Present State and Technic of Artificial Fever", read at Southern Section, American Congress of Physical Therapy, New Orleans, March 23, 1936.

⁽⁹³⁾ Evan S. Jones: "Syphilis and Insanity", *THE MEDICAL JOURNAL OF AUSTRALIA*, October 9, 1936.

⁽⁹⁴⁾ C. Farran-Ridge: Personal communication.

⁽⁹⁵⁾ L. Horn: "Vergleichende Nachuntersuchungen bei malaria- und rekurrensbehandelten Paralytikern", *Psychiatrisch-neurologische Wochenschrift*, August 4, 1928, page 336.

⁽⁹⁶⁾ E. P. Dark: "The Inductotherm", *THE MEDICAL JOURNAL OF AUSTRALIA*, September 19, 1936.

⁽⁹⁷⁾ M. A. Bahr: Annual Report, Central State Hospital, Indianapolis, 1935.

⁽⁹⁸⁾ "Annotation", *The Lancet*, May 30, 1936, page 1248.

⁽⁹⁹⁾ R. A. Boak, C. M. Carpenter and S. L. Warren: "Studies on Physiological Effects of Fever Temperatures: Thermal Death Time of *Treponema pallidum* in Vitro, with Special Reference to Fever Temperatures", *Journal of Experimental Medicine*, Volume LVI, November, 1932, page 741.

⁽¹⁰⁰⁾ Bessemans: "The Local Application of Heat as an Adjunct in the Social and Individual Prophylaxis of Syphilis."

⁽¹⁰¹⁾ Oliver Laibham: Personal communication.

⁽¹⁰²⁾ Brunsch: "Histopathology of Therapeutic Tertian Malaria", *American Journal of Psychiatry*, July, 1932.

⁽¹⁰³⁾ J. M. Davidson: "The Mechanism of Malaria Cure in General Paralysis", *The Journal of Mental and Nervous Diseases*, Volume LXXXIV, July, 1936, page 46.

THE SOLDIER-DOCTOR.

By LAURENCE DUNCAN,
Melbourne.

With my own eyes, at little more than the distance across this room, I saw, in South Africa, a doctor gain the Victoria Cross. I know how nearly the rôle of the medical profession corresponds to that of a self-sacrificing priesthood in its devotion to causes and humanities which in this world bring no material gain.

(Winston Churchill, November 24, 1928.)

THE province of the medical officer is the saving, not the destruction of life; nevertheless, on a number of occasions, provoked beyond endurance or defending the wounded under his care, he has shouldered a musket and measured swords with the enemy. In Indian warfare one remembers Dr. Holwell, the gallant defender of Calcutta in 1756, when that city was besieged by the Nawab of Bengal; John Wylie, who in 1817, at the battle of Corygaum, won the C.B. for his dauntless conduct both in attending to the wounded and leading the Sepoys to the attack; Dr. Joseph Fayrer, Dr. Home and Dr. Bradshaw, during the siege of Lucknow. Dr. (afterwards Sir Joseph) Fayrer was residency surgeon and assistant political officer at Lucknow at the time of the siege of that city in 1857. His house was used both as a hospital and a fortress, and Fayrer himself took a prominent part in the defence besides attending to the sick and wounded. Dr. Home and Dr. Bradshaw, for their heroic defence of the wounded entrusted to their care, were both awarded the Victoria Cross.

At the battle of Inkerman, Dr. Wolseley led a remnant of the Guards through a heavy Russian column, and Dr. Wilson, of the Seventh Hussars, not only did excellent service in the same battle by rallying a detachment of the Guards, but rescued the Duke of Cambridge from a position of extreme danger. For these services Wilson, after the battle, received the thanks of the Duke at the head of the brigade. Dr. (afterwards Sir) Charles Ryan, while serving as a surgeon under the red crescent, on

several occasions led Turkish troops at Plevna. In the Great War, to quote one instance, Colonel Lawrence's friend, tent mate and medical officer, Major Marshall, M.C., R.A.M.C., divided his attention between bacteriology and blowing up Turkish trains. Lowell Thomas says that Marshall "on his trips into the desert would fill his stretchers with high explosives, and after a raid would throw out all the remaining dynamite and substitute the wounded. After inflicting casualties among the Turks he would proceed to bandage them up."

Combatant commissions have sometimes been offered to and accepted by medical officers. The present Chief of the Canadian General Staff, Major-General Ernest Charles Ashton, C.M.G., M.D., graduated in medicine at Toronto in 1898 and practised for a number of years as a surgeon. Thomas Sydenham, called by many the English Hippocrates, served as a captain of horse with Cromwell's troops before he turned physician.

During the Peninsular War the call of active service led Dr. Sir Robert Macara to resign his post as surgeon on an Indiaman. He already held a combatant commission in the British Army. Joining up with the Black Watch as captain in 1803, he became major in 1805, Lieutenant-Colonel in 1812, and in November, 1813, was promoted to the command of his regiment. Much of his service was spent in hard fighting in the Peninsula, and on January 2, 1814, he was made K.C.B. On June 16 his regiment took part in the engagement at Quatre Bras, and there Macara was struck by a musket ball, fell from his horse, and on the ground was killed by a thrust from a lance.

Another doctor who turned soldier was Samuel Halliday Macartney, who during the Taiping Rebellion commanded the Chinese troops which cooperated with General Gordon's "Ever Victorious Army". Macartney arrived in China in 1860 as a surgeon attached to a British regiment, and served with it in the earlier fighting. In 1862, seeking a wider and more adventurous career than the medical service of the army seemed to offer, he resigned from the British Army in order to enter the Chinese service. He had attracted the notice of Li Hung Chang, who appointed him with the rank of colonel to command a separate contingent of Chinese troops to act in concert with General Gordon; and he took an active part in crushing the Taiping Rebellion. He founded the first Chinese arsenal at Nanking, of which for ten years he was governor. He then entered the diplomatic service and for thirty years was counsellor and secretary to the Chinese legation in London. Gordon said of Macartney that "he drilled the troops, supervised the manufacture of shells, gave advice, brightened the Futai's intellect about foreigners, and made peace, in which last accomplishment his forte lay".

In 1893 Dr. Jameson, while Administrator of Mashonaland, led his volunteer force of about seven hundred miners and farmers against the Matabele, the best disciplined and most ferocious fighters of

the warrior tribes of South Africa. Jameson, it is true, held no military rank, but he was the moving spirit of the expedition and the first in authority in all counsels of war. Within two months his little army was triumphant; Lobenguela, with the remainder of his fighting men, had fled; and Jameson had added a vast and wealthy territory to the Empire. For this exploit Jameson won great praise as a military leader (it was later somewhat dimmed by the tragic failure of his famous raid into the Transvaal). The Queen conferred on Jameson the honour of C.B., and about this time Earl Grey said: "I am using no empty phrase when I say that Dr. Jameson's exploits as an administrator have rivalled his exploits as a general."

Fighting with the Boers against the British in the South African War was a colonel who after the war ended graduated in medicine—Dr. Arthur Lynch. Born at Smythesdale, Victoria, in 1861, Lynch was educated at Grenville College, Ballarat, and at the University of Melbourne, where he obtained his degrees as Master of Arts and civil engineer. His thirst for knowledge unassuaged, he sailed for Europe, where he studied for some months at Berlin before going to London, where he earned his living as a journalist. Ere its outbreak, Lynch had seen the Boer War coming and his sympathies were all with the Boers. When war began he obtained a commission from *Ellier's Weekly*, of New York, and the *Paris Journal*, and without any thought of participating as a combatant set out for South Africa. There he soon became very friendly with Botha, who indicated that the best way he could help them was to assist in the organization of a troop then being formed of a number of Irish, foreigners and young Afrikaners. Convinced of the probity of the Boer cause, Lynch threw himself into the organization of the new troop and made one of a deputation of its leaders which waited on President Kruger. One of the spokesmen proposed that Arthur Lynch should be commander of the troop; the rest of the interview is best told in Lynch's own words.

I stepped forward. There was I, then at last in the testing place. I felt myself in the centre of Kruger's eyes as he looked at me with a steady stare.

A pause.

"Have you ever commanded men in battle?" he asked with a deep growl.

"No."

Another pause, during which he still stared at me.

"Do you think you can command men at the front?" he demanded.

"Of that I have no doubt," I replied at once. "I will not disappoint you. I will lead this troop all right."

"Well," in the deep growling voice, "I think you will."

My command was settled; only one question remained, and that was as to rank and title.

"What shall it be?" said Kruger.

"Colonel," I answered at once.

Kruger banged the table with impatience.

"It's necessary for success," I said, "to give that title. Please make out the commission as colonel."

Between a growl and a smile he reached for the paper and gave the signature that fixed it.

Lynch served till near the end of the campaign, when the Boer leaders asked him to visit the United States in order to plead their cause. Some time after peace was declared, a Galway constituency elected him as their parliamentary representative; the reply of the government was to issue a warrant for his arrest. Lynch was in Paris at the time, but, feeling that it was his duty to cross over to England in order to take his seat, he courageously set out for Dover. He was arrested, tried and sentenced to death;¹ after a short time the sentence was commuted to imprisonment for life, and at the end of a year he was released. He then took up his medical course at Saint Mary's Hospital, London, and after a few years graduated in medicine. In 1907 he was granted a free pardon. From 1909 to 1918 he was a member of the House of Commons, and when the Great War threatened he was wholeheartedly British and used all his influence to press the government into the war. The day after the declaration of war he offered himself in any capacity for the allied cause. Asked afterwards how he reconciled fighting against and for Britain on different occasions, he replied: "In each case I was fighting for liberty." For some time he acted as an unofficial liaison officer between French and British Cabinet Ministers, till in 1918 he was invited to go to Ireland to assist recruiting and was given the rank of colonel of the Tenth Munster Fusiliers. Colonel Lynch of the Boer command, who was tried for treason and condemned to be hanged, sixteen years later, during the Great War, became a colonel in the British Army.

During the Great War of 1914 to 1918 numerous medical men, believing that they would be of greater service as fighting men than as medical officers, accepted combatant commissions. Of such was Arthur O'Hara Wood, a major in the British Royal Air Force, known to the flying world in France as "Anzac", who was killed on October 4, 1918, while leading a flying patrol over St. Quentin.

In the armies of non-British countries the medically trained man has made his mark as a soldier and has frequently risen to general's rank. America provides the most resplendent examples. The American War of Independence awoke the military genius of more than one of her doctor sons. Dr. Joseph Warren, of Boston, one of the leaders of the pre-revolutionary movement, was commissioned as Major-General in 1775, but a few days before his commission became effective he went with the Independent troops to Bunker Hill. Preferring to gain his first experience of actual warfare under experienced leaders, he fought in the ranks as a volunteer in the desperate battle which ensued, and towards the end, while rallying the troops, was killed. Hugh Mercer, one of Washington's generals, was a physician. While still engaged in medical practice, he trained the Virginia militia, and early

¹In the opening scene of "The Play Boy of the Western World" the Irish dramatist Synge makes allusion to his friend Arthur Lynch. Christy Mahon is asked: "or did you go fighting bloody wars for Kruger, young fellow, the like of the man beyond who was sentenced to be hanged, quartered and drawn?"

in 1776, at Washington's request, Congress appointed him brigadier-general, with the command of the "flying army". Mercer was with Washington at the battle of Princeton; there he was fatally wounded, and in his last moments was attended by the famous Dr. Benjamin Rush, one of the five medical men who signed the Declaration of Independence. Several other medical men, Dr. Thomas Walker, Dr. Edward Hand, Dr. Oliver Wolcott, Dr. Arthur St. Clair and Dr. James Wilkinson, attained the rank of general in the war of the revolution. Dr. Oliver Wolcott served with great distinction for the duration of the war, rising to the rank of brigadier-general. Arthur St. Clair became a major-general and subsequently a governor of Ohio. Dr. James Wilkinson, a general of the revolution, afterwards became general-in-chief of the American Army.

During more recent times three men who received their first commissions in the army of the United States of America as surgeons, have risen to the rank of major-general in the combatant forces: Major-General Crawford, Major-General Ainsworth and Major-General Leonard Wood. Samuel Wylie Crawford became a surgeon in the army about 1851, and at the outbreak of the Civil War was assistant surgeon and captain at Fort Sumter. Transferred to the line of the regular army, he was appointed a brigadier-general of volunteers in 1862. He served with distinction at Gettysburg and in Grant's Virginia campaign. After the war General Crawford continued his service in command of a regiment of infantry till 1873, when he retired owing to disability resulting from wounds sustained in the Civil War.

Fred Crayton Ainsworth took his doctor's degree at New York University in 1874 and soon afterwards entered the medical corps as the army assistant surgeon. In 1891 he was promoted to surgeon-major, and in the following year left the army medical service to become chief of the record and pension office of the War Department, with the rank of colonel. From that time his advancement came in quick succession: brigadier-general in 1899; major-general and military secretary, United States Army, 1904; in 1907 he became adjutant-general.

Far-famed in the recent history of America is probably the greatest military leader who has risen from the ranks of medicine: Major-General Leonard Wood. Graduating in medicine at Harvard University in 1884, after practising for less than a year at Boston, Wood joined the army as a surgeon, and in twenty-two years rose to the highest position in the regular army. Anticipating the arrival of his commission as assistant surgeon, in 1885 he served as an officer commanding infantry in the fighting against the Indians on the Mexican border and there won the most coveted American military distinction—the Medal of Honor. Then came experience as surgeon at various military stations, till in 1895 he was ordered to Washington. In 1898, when war broke out with Spain, he was officially attached as surgeon on President McKinley's staff. Theodore Roosevelt was then Secretary in the Naval

Department, and Wood and he became great friends. Together they organized the regiment of volunteer cavalry known as the Rough Riders, with Wood as colonel and Roosevelt second in command. On the capture of Santiago, Wood, then aged thirty-seven, and promoted brigadier-general, United States Volunteers, became governor of the city. In the administration of that fever-stricken city he was eminently successful; and in the following year he was promoted major-general, United States Volunteers, and was appointed governor-general of Cuba. Returning to the United States in 1902, Wood was made a brigadier-general in the regular army; in 1903 he was made major-general and was sent to the Philippines as governor of the Mindanao Province. In 1905 he became commander-in-chief of the American forces in the Philippines, and stayed there till 1910, when he returned to the United States to take up duty as chief-of-staff. For the next four years he was the head of the American forces under the President of the United States of America, and it was largely due to Wood that what little preparation was made in advance of America's entry into the Great War was made at all. In 1914 Wood was relieved of his position of chief-of-staff and detailed to command the Department of the East. On April 6, 1917, when the United States of America declared war on Germany, Major-General Wood still occupied the senior position in the United States Army, and as the first of five major-generals senior to General Pershing, many considered that he should have been given the command of the American Expeditionary Force. His unpopularity with President Wilson was probably the deciding factor.

Other nations, France and Italy, can each claim eminent doctor-soldiers. Jean Baptiste Rusca (1759-1814), while serving as a medical officer with Napoleon's army during the Italian campaign, was given a combatant commission and six years later was promoted to be general of a division. He was killed at Soissons in 1814.

Jean Pierre Joseph Bruyère (1772 to 1813), surgeon-major in Napoleon's *Grande Armée*, became dissatisfied with the conditions of the medical officers and resigned his commission. He reenlisted as a private in the combatant service and quickly rose to be a general of a division and a count of the empire.

A Dublin physician, William Lawless (1772 to 1824), outlawed from Ireland for taking part with the United Irishmen, sought refuge in France and joined Napoleon's army. In 1803 he was appointed captain of the Irish Legion. In 1812 Napoleon made him lieutenant-colonel and in 1813 colonel. In that year he was wounded at Löwenberg and his leg was amputated by Larrey. He was placed on half pay with the rank of brigadier-general and died at Paris in 1824.

More recently, General J. Frederic Canonge graduated in medicine before he was promoted to the rank of lieutenant. He became a commander of the Legion of Honour, and in 1899, with the rank

of general, was given the command of the Fifteenth French Army Corps.

During the War (1914 to 1918) Boriani, who for many years had practised medicine, rose to the rank of general in the Italian Army.

The medical profession has produced one or two other combatant leaders in war; but, taken in all, as one would expect, they are few.

While the medical officer is non-combatant in the sense that he fights not opposing troops, but disease and wounds, he does not escape the innumerable risks and hardships of war. In the fulfilment of their duties medical officers have sustained as high a mortality as officers of infantry. Since the institution of the Victoria Cross, out of the 1,157 awarded to men of all ranks, thirty-five have been awarded to medical officers.

In every war from the time of the siege of Troy, when the two physicians, Podalirius and Machaon, went with the Greeks to battle, medical men have done much to mitigate the cruelties of war, both in the field and after battle. Medicine has given to war many great men, who in their own field of service were equally of the brave. Some of the greatest figures in British medicine were at some time in their careers military surgeons—men like Thomas Willis, William Harvey, Percival Pott and John Hunter. Famous military surgeons like Thomas Gale, who served in the army of Henry VIII and published a book on gunshot wounds; Robert Clowes, of Elizabeth's reign, whose last service was with the fleet that defeated the Spanish Armada; Peter Lowe, the founder in 1599 of the Faculty of Physicians and Surgeons of Glasgow; John Woodall, who in 1628 published the first work in English devoted to military and naval surgery; Richard Wiseman, of the Stuart dynasty; and Sir James McGregor, who served under Wellington in the first Peninsular War and in 1815 became the first director-general of the Army Medical Department, did much to raise the standard of naval and military surgery to its present status.

Sir John Pringle (1707 to 1782) is regarded as the founder of modern military medicine and sanitation. His classic work, "Diseases of the Army", published in 1752, exerted an enormous influence both at home and abroad. Pringle has a greater claim to fame; he was the instigator of the Red Cross idea—the humane practice of both sides in European wars sparing hospitals. In 1742 he was appointed physician-general to the British forces in Flanders, and it was at Pringle's suggestion that about the time of the battle of Dettingen, in 1743, the Earl of Stair, the commander of the British forces, proposed to the Duc de Noailles, the French commander that "military hospitals on either side should be regarded as neutral and mutually protected". This suggestion was at once agreed to by the French general and strictly observed throughout the campaign. Subsequently this practice remained loosely in force until in 1864 it became the universal custom through the energetic activities of a Swiss civilian, Henri Dunant, and the signing of the

Geneva Convention, in which fourteen different countries pledged themselves to regard the sick and wounded, as also the army medical and nursing services, as neutrals on the battle ground.

Five hundred years ago the Maid of Orleans was bought by the English from John of Luxembourg and Burgundy, who had made her prisoner, and delivered to the inquisition for trial. Among her judges¹ were two doctors of medicine, Jean Tiphaine and Guillaume Delachambre. When Joan of Arc lay sick in prison, yet still in chains, they visited her at the request of the Earl of Warwick, who said to them: "Joan, according to report, has fallen ill. I have sent for you that you may try to cure her. The King of England would not for anything in the world have her die a natural death, for he holds her dear, having paid dearly for her. He intends that she shall die only by law and be burned. Do therefore what is necessary. Attend her with great care and try to cure her." The two doctors found she had a fever and desired to bleed her, but the Earl intervened, saying that Joan was sly and might well kill herself, bidding them take care. Nevertheless, they bled her and afforded great relief. When the trial had reached its term and judgement was to be passed, Tiphaine and Delachambre both voted for Joan's conviction and the fire. But small blame can be attached to them. They dared not express a favourable opinion, for threats were made by the chief judge, Cauchon, Bishop of Beauvais, that if they did not give their signatures, evil would come to them in Rouen. So St. Joan was found guilty of heresy and witchcraft and was burned alive in the Rouen market place in 1431. Twenty-five years later, in a fresh trial, the verdict was annulled; Jean Tiphaine and Guillaume Delachambre both spoke in her favour, testifying "to her goodness and virtue and the malignity of her enemies".

It was Ambroise Paré,² the great French military surgeon, who put an end to the atrocious practice of dressing wounds with boiling oil and stopping hemorrhage with the canter, substituting emollient dressings and reintroducing the ligature. For more than thirty years, from 1537 to 1569, Paré followed his profession with the army, won the confidence of kings and military leaders and became the soldiers' hero. In his surgical memoirs he related how he came to make his first and greatest contribution to military surgery:

Now I was at this time a fresh-water soldier; I had not yet seen wounds made by gunshot, at the first dressing. It is true I had read in Jean de Vigo³ that wounds made

¹ Pierre Cauchon, Bishop of Beauvais presided. Jean le Maître, Deputy Inquisitor in the Diocese of Rouen associated with him. Also sat with them a large body of assistants and assessors, and among them Tiphaine and Delachambre.

² Ambroise Paré, born in 1510 at Bourg Hersent, later renamed Laval, in the Province of Mayenne, France; became surgeon to four kings, and during a period of thirty-two years accompanied the armies of France on most of their campaigns. "I dressed him, God healed him" was Paré's humble statement. He died in 1590.

³ Giovanni de Vigo (John of Vigo), born at Rapallo, Italy, about 1460, died soon after 1517; published at Rome, 1514, a great treatise on surgery. The first author to write upon gunshot wounds and maintain that they were poisoned wounds.

by firearms partake of venosity; and for their cure he bids you cauterize them with oil of elders scalding hot, mixed with a little treacle. And to make no mistake, before I would use the said oil, knowing this was to bring great pain to the patient, I asked first, before I applied it, what the other surgeons did for the first dressing, which was to put the said oil, boiling, well into the wounds, wherefore I took courage to do as they did. At last my oil ran short and I was forced instead thereof to apply the yoke of eggs, oil of roses and turpentine. In the night I could not sleep in quiet, fearing some default in not cauterising, that I should find the wounded to whom I had not used the said oil, dead from the poison of their wounds, which made me rise very early to visit them; when beyond my expectation I found that those to whom I had applied my digestive medicament had but little pain and their wounds without inflammation or swelling, having rested fairly well that night; the others to whom the boiling oil was used, I found feverish, with great pain and swelling about the edges of their wounds. Then I resolved never more thus cruelly to burn poor men with gunshot wounds.

Some years later Paré had the courage to rescue the ligature from oblivion and to prove it infinitely preferable to the cautery for the arrest of hæmorrhage in amputations.

Against the backgrounds of the military conquests of Napoleon Bonaparte the medical officer shows most favourably. Desgenettes, physician-in-chief, Percy and Larrey, surgeons-in-chief to the *Grande Armée*, were of the finest types of the army doctor. Napoleon made all three barons of the empire, and their names were inscribed on the Arc de Triomphe.

Nicolas René Dufriche Desgenettes was born at Alençon in 1762, and after studying medicine in Paris, London and Italy, took his doctor's degree at Montpellier in 1790. In 1793 he was appointed a medical officer to the French army in Italy; there he first met Napoleon and so won his esteem that in 1796 Napoleon made him physician-in-chief to the army of the east. Desgenettes accompanied Bonaparte to Egypt, and during this eastern campaign there occurred the incident which has made him known to many. When it was suggested to him by Napoleon that he should poison the plague-stricken soldiers at Jaffa, Desgenettes curtly answered that it was his business to prolong life, not to kill. The story has been told in various ways. Abbott¹ says that when arrangements were being made for the transport of the sick and wounded following Napoleon's decision to evacuate Jaffa, some were found to be so desperately wounded or dangerously ill with the plague that it was impossible to move them. Napoleon asked his medical men to consult together with regard to these unfortunate sufferers. They reported that in all probability few would be alive in twenty-four hours. If left behind, they would be taken prisoner by the Turks and tortured to death. If taken on, there was the danger that those dying of the plague would spread infection through the whole army. Napoleon at last suggested to the physician the expediency of administering to them an opium pill which would expedite by a few hours their death and thus save them from the hands of a cruel foe. The physician

gave the highly admired reply: "My profession is to cure, not to kill." The historian then records that Napoleon said no more upon the subject, but left a rearguard of five hundred men to protect them from the advancing enemy till the last of the sick had expired.

The story as told by Desgenettes himself in his memoirs runs slightly differently. Desgenettes narrates that shortly before the raising of the siege, Napoleon sent for him very early in the morning, and after a short preamble on their sanitary condition, said to him: "If I were you, I would end at once the suffering of those stricken with plague, and should end the dangers with which they threaten us by giving them opium." He answered simply: "My duty is to preserve life." The general pointed out that it was his duty to prevent his abandoned sick from falling alive under the scimitar of the Turk and that he was advising for others what in like circumstances he would ask for himself. "I do not seek", he went on, "to overcome your repugnance, but I believe I shall find some who will better appreciate my intentions." Desgenettes states that as a matter of fact opium was given to some thirty patients, but some rejected it by vomiting and told what had happened.

The above was not the only occasion on which Desgenettes checked his imperious chief. At the meeting of the first Extraordinary Health Committee of the Army, which Bonaparte had organized after their return to Cairo, there arose a discussion on a point of chemistry, and Napoleon in a temper exclaimed: "Chemistry is the kitchen of medicine, and medicine itself the science of assassins." During the awe-struck silence which followed this outburst, Desgenettes quietly asked Napoleon how he defined the science of conquerors. Napoleon was silenced. Despite such *contretemps*, the general and his physician-in-chief remained loyal friends. Desgenettes accompanied his chief through the disastrous Russian campaign, was twice taken prisoner, and was present at the Battle of Waterloo. He died in 1837.

Of Baron Dominique Jean Larrey, the famous surgeon of Napoleon's Guard, Napoleon always spoke in the highest praise. Larrey was the greatest French military surgeon of his time. He served in twenty-six campaigns and was several times wounded. He was the idol of the soldiers, as was Ambroise Paré before him. On one occasion, finding that his wounded were starving, he commandeered a number of officers' horses and had them killed to provide food for the soldiers. A great outcry came from the officers, but Napoleon supported Larrey in his high-handed action. He invented the "flying ambulance". Perceiving the enormous advantages in getting the wounded quickly into hospital, he devised light, well-sprung ambulances which could move with speed. Through all his campaigns, in victory and defeat, Larrey accompanied the Emperor, till the battle of Waterloo, where, while attending to the wounded, a squadron of Prussian lancers came dashing down upon him. Mounting

¹ "History of Napoleon Bonaparte", by John S. O. Abbott.

his horse, he fired both pistols at them and galloped away. They shot his horse and sabred him as he lay upon the ground, leaving him, as they thought, dead. Larrey recovered his senses, however, and walked several miles before he was captured by another detachment of Prussian cavalry. It was decided to shoot him, but his life was saved by a young German surgeon who recognized him. Shortly afterwards he was sent to Blücher, who gave him the means to return home. Larrey was as great a favourite with Napoleon as he was with the troops. Napoleon said of him: "If France ever wishes to erect a monument out of gratitude let it be to Larrey." And when he made his will at St. Helena he left 100,000 francs to Larrey, "the most virtuous man I have ever known". O'Meara has recorded that at St. Helena, Napoleon, in the course of conversation, remarked to him:

Larrey was the most honest man and the best friend to the soldier whom I ever knew. Indefatigable in his exertion for the wounded, he was seen on the field of battle immediately after an action, accompanied by a train of young surgeons, endeavouring to discover if any signs of life remained in the bodies. He scarcely allowed a moment of repose to his assistants, and kept them ever at their posts. He tormented the generals and turned them out of their beds at night whenever he wanted accommodation or assistance for the sick or wounded. They were all afraid of him, as they knew that if his wishes were not complied with, he would immediately come and make a complaint to me.

A third doctor, Jean Nicolas Corvisart, a famous physician and the chief teacher of Laennec, played an important rôle in the Napoleonic drama. Bonaparte anxiously desired an heir. His supporters told him plainly that in the event of his death France would not accept his brothers, and the Bourbons would be recalled. They urged him that in the interests of France and his dynasty it was his duty to divorce Josephine, who was ten years his senior. This he would not do while doubtful of his own fertility, for Josephine, with cunning and with diligence, had fostered in Napoleon the idea that he was incapable of fatherhood. When his liaison with a young lady who had been reader to his sister Caroline proved that idea to be false, Napoleon knew that Josephine was infecund; but still he was loath to divorce her. To circumvent the difficulty it was suggested that she should feign the signs and symptoms of maternity so that he might proclaim his son by another woman as his heir. Josephine consented and the plan would doubtless have been carried to fruition and Napoleon would have remained with the only woman whom he truly loved, had it not been for the integrity of Corvisart. He was court physician and bluntly refused to take any part in the fraud.

Of the several medical men¹ who entered into the last phase of Napoleon's career, the one whose name is best known is Barry O'Meara. When it was found that the emperor's surgeon could not accompany him to St. Helena, O'Meara, then surgeon on the *Bellerophon*, volunteered to go. During those last

unhappy years spent on the island, O'Meara, by his medical care and friendship, did much to brighten Napoleon's existence and to mitigate the tactless persecution of Sir Hudson Lowe, till the latter forced him to resign. For Dr. Archibald Arnott also the emperor conceived a warm regard; before his death he presented him with a gold snuff box, and to his executors he gave orders to give Arnott 600 napoleons in recompense for his services. Let us conclude this brief account of the medical men associated with Napoleon with his own words: "I have a higher opinion of the medical, or rather the surgical profession, than of any other."

In the Great War of 1914 to 1918 the services rendered by the medical profession were, in modest words, at least commensurate with the magnitude of the conflict. The Golden Book, a memorial to French medical men killed in the Great War, contains a list of over seventeen hundred medical officers who died for their country. In the British forces the only two officers who were awarded bars to the Victoria Crosses which they had previously won, belonged to the Royal Army Medical Corps. Major Arthur Martin-Leake, who in the South African War had been awarded the Victoria Cross for great devotion to duty, was the first to win the bar in November, 1914, when he rescued a large number of wounded while exposed to constant fire. Captain Noel Godfrey Chavasse, Royal Army Medical Corps, who died of wounds in August, 1917, was the only man awarded both the Victoria Cross and a Victoria Cross bar during the Great War. No less gallant were six British medical officers who in 1915 sought and obtained permission to enter the German prison camp at Wittenberg² and attend the prisoners who were ravaged by typhus fever. Within five weeks three of the six doctors, Major Fry, Captain Field, and Captain Sutcliffe, died of the disease; their places were at once filled by valiant successors. Still fresh within our memories is the fine work done at the Queen's Hospital, Sidcup, by Dr. H. D. Gillies and his team (assisted by Professor Henry Tonks, artist and surgeon both) in repairing tragic facial disfigurements caused by the war.

History records in full the deeds of great generals and the destruction wrought by their armies; little do we hear of the surgeons who followed in their train. Yet no less brave were they, no less important their work. It may well be that future generations will look on war as an anachronism and future historians delight in telling, not of the destruction wrought by leaders of war, but of the beneficent activities of great men in war. For although a past generation removed Jenner's³ statue from

¹ There were 12,000 prisoners of war and a number of civilians in Wittenberg camp, Germany, when, early in 1915, typhus fever broke out. The German staff, military and medical, hastily fled, leaving the disease-stricken prisoners with practically no drugs, medical appliances or even such ordinary necessities as soap and linen.

² Dr. Edward Jenner, the discoverer of vaccination, died of apoplexy on January 26, 1823. In May, 1858, the Prince Consort unveiled in Trafalgar Square a bronze statue of Jenner by Calder Marshall, R.A., the cost of which had been defrayed by public subscription. In 1862 the statue was removed from its original site to Kensington Gardens.

³ Rutledge, Walter Henry, James Roche Verling, Archibald Arnott, Barry O'Meara, Francis Buxton, Alexander Baxter, Stokes, Antommarchi and Thomas Shortt.

Trafalgar Square to make room for a military hero, there is an ever-increasing public which accords the dignity of greatness only to the achievements of men and women who have contributed to human welfare.

Appendix.

The following is a list of medical officers who have won the Victoria Cross.

- J. Mount, surgeon, 6th Dragoons, Crimea, 1854.
 W. H. T. Sylvester, assistant surgeon, 23rd Regiment, Royal Welsh Fusiliers, Crimea, 1855.
 J. Jee, surgeon, 78th (Seaforth) Highlanders, Indian Mutiny, 1857.
 V. M. McMaster, assistant surgeon, 78th (Seaforth) Highlanders, Indian Mutiny, 1857.
 H. T. Reade, surgeon, 61st (Gloucester) Regiment, Indian Mutiny, 1857.
 A. D. Home, surgeon, 90th Regiment (Scottish Rifles), Indian Mutiny, 1857.
 W. Bradshaw, assistant surgeon, 90th Regiment (Scottish Rifles), Indian Mutiny, 1857.
 W. G. Manley, assistant surgeon, Royal Artillery, New Zealand, 1864.
 C. M. Douglas, assistant surgeon, 24th Regiment (South Wales Borderers), Andaman Islands, 1867.
 E. B. Hartley, surgeon-major, Cape Mounted Rifles, Basutoland, 1879.
 J. H. Reynolds, surgeon-major, Royal Army Medical Corps, Zululand, 1879.
 J. F. McCrea, surgeon, Cape Mounted Yeomanry, Basutoland, 1881.
 F. S. Le Queane, surgeon-captain, Royal Army Medical Corps, Burma, 1889.
 J. Crimmin, surgeon, Indian Medical Service, Burma, 1889.
 O. E. P. Lloyd, surgeon-major, Royal Army Medical Corps, Burma, 1893.
 H. F. Whitchurch, surgeon-captain, Indian Medical Service, Chitral, 1895.
 W. J. Maillard, surgeon, Royal Navy, Crete, 1898.
 W. Babbie, major, Royal Army Medical Corps, South Africa, 1899.
 H. E. M. Douglas, lieutenant, Royal Army Medical Corps, South Africa, 1900.
 E. T. Inkson, lieutenant, Royal Army Medical Corps, South Africa, 1900.
 N. R. Howse, captain, New South Wales Medical Staff Corps, South Africa, 1900.
 W. H. S. Nickerson, lieutenant, Royal Army Medical Corps, South Africa, 1900.
 T. J. Crean, surgeon-captain, Imperial Light Horse, South Africa, 1901.
 A. Martin-Leake, surgeon-captain, South African Constabulary, South Africa, 1902.
 H. S. Ranken, captain, Royal Army Medical Corps, Great War, 1914.
 Arthur Martin-Leake, lieutenant, Royal Army Medical Corps, Great War, 1914.
 G. A. Maling, lieutenant, Royal Army Medical Corps, Great War, 1915.
 F. A. C. Scrimger, captain, Canadian Army Medical Corps, Medical Officer, 14th Battalion, Royal Montreal Regiment, Great War, 1915.
 John Leslie Green, captain, Royal Army Medical Corps, Great War, 1916.
 W. B. Allen, M.C., captain, Royal Army Medical Corps, Great War, 1916.
 N. G. Chavasse, captain, Royal Army Medical Corps, Great War, 1916.
 J. A. Sinton, captain, Indian Medical Service, Great War, 1916.
 H. Ackroyd, M.C., captain, Royal Army Medical Corps, Great War, 1917.
 N. G. Chavasse, M.C.,¹ captain, Royal Army Medical Corps, Great War, 1917.

¹ Bar to the Victoria Cross.

- J. F. Russell, M.C., captain, Royal Army Medical Corps, Great War, 1917.
 B. S. Hutcheson, captain, Canadian Army Medical Corps, Medical Officer, 75th Battalion, 1st Central Ontario Regiment, Great War, 1918.
 H. J. Andrews, M.B.E., captain, Indian Medical Service, Waziristan, 1919.

From 1854 to the present time 1,157 Victoria Crosses and two Victoria Cross bars have been awarded. Lieutenant Arthur Martin-Leake, Royal Army Medical Corps, and Captain N. G. Chavasse, Royal Army Medical Corps, are the only persons to whom have been awarded bars to their Victoria Crosses.

SUPPURATION IN THE PETROUS TEMPORAL IN MASTOIDITIS.¹

By ERIC GUTTERIDGE, M.D., D.L.O., F.R.C.S. (Edin.), F.R.A.C.S.,

Honorary Aural Surgeon, The Victorian Eye and Ear Hospital, Melbourne.

THERE is a small proportion of patients suffering from acute mastoiditis, who, after an apparently complete exenteration of the mastoid antrum and air cells, develop at a later date cerebral complications. In these the mastoid processes are almost invariably well pneumatized, the exposure and removal of the cell walls and mucosa have been tedious, the *dura mater* and sinus have almost certainly been exposed and are not diseased, and the predominant organism is the *Streptococcus mucosus*. There has perhaps been an excessive watery purulent discharge, with a slightly raised temperature. Then suddenly appears a cerebral complication such as meningitis. There has been considerable reference in the literature to this type of condition under the heading of petrositis or apicitis.

Myerson, Rubin and Gilbert point out that 38% of temporal bones show pneumatized mastoid processes, and that 11% of temporal bones have pneumatization of the petrous process, extending to the apex. There have been no reports of any pneumatization of the apex without concurrent aeration of the mastoid process. The youngest patient to have a pneumatized tip was aged fifteen years.

The cells are either supracochlear or infracochlear.

Supracochlear cells occur: (i) on the anterior surface, originating in the angle between superior and semicircular canal and the facial nerve; (ii) along the superior border; (iii) on the posterior surface.

Infracochlear cells are of three kinds: (i) anterior cochlear cells; (ii) subcochlear, forming the cells in the vicinity of the jugular bulb with (iii) posterior cochlear cells.

The tip cells are divided by an arbitrary line drawn through the superior edge of the carotid canal into superior and inferior cells.

¹ Read at a meeting of the Ear, Nose and Throat Section of the Victorian Branch of the British Medical Association, June, 1936.

The petrous wedge is more or less cellular, with galleries of cells advancing towards the apex and towards the periosteum and the overlying cerebral and cerebellar *dura mater*.

With the infection spreading into these cells there is a suppurative necrosis of the mucosal lining, with an empyema if the drainage is insufficient, and a spreading osteitis. There is a rupture into the extradural space in one or other fossa, and after a lapse of some days this membrane is digested and the subdural space is involved. On *post mortem* examination the petrous is found to be almost completely destroyed, with the otic capsule lying loose and exfoliated. This is reported in certain cases of silent labyrinth destruction—without signs or symptoms of labyrinth irritation or destruction.

A second method is by spread from superficial cells to the superior or inferior petrosal sinuses and thrombosis of the lateral sinus or meningitis, or brain abscess.

There may be infection of the peritubal cells along the Eustachian tube to the apex, or the carotid peritubal cells may rupture into the carotid canal and so to the *cavum Meckelii*.

The Clinical Course.

The clinical sequence of events is usually acute *otitis media*—myringotomy—simple mastoidectomy. After mastoidectomy the patient does well, with the exception of occasional headaches, but the aural and post-aural discharge persists, scantily or profusely, or it may clear up and then recur. In two cases the patient was up and about to go home when recurrence took place. This period of seven to ten days is known as the Kopetzky interval. Then with dramatic suddenness there appears an agonizing pain behind the eye. No ordinary sedatives will relieve this pain. Von Voorthuysen states that it is due to irritation of the *nervus tentorius*, the recurrent branch of the ophthalmic division of the fifth nerve. This nerve "arises a short distance behind the superior orbital fissure, and runs backward in close association with the fourth nerve to ramify between the layers of the *tentorium cerebelli*".

Kraus, however, states that the pain is due to involvement of the Gasserian ganglion, and adds that there is a diminished corneal reflex; while Kisch states that there may be pain in the other branches of the fifth nerve in the temporal and parietal regions.

Archer has described a progressive loss of sensation in the trigeminal skin areas; first heat sense, then pain sense and then tactile sense disappeared following an abscess in the region of the Gasserian ganglion. Eagleton suggests that the pain may be due to irritation of the great superficial petrosal nerve, analogous to neuralgia of the sphenopalatine ganglion.

The second dramatic sign is paralysis of the sixth nerve. This is the Gradenigo sign described in 1904. The sixth nerve pierces the *dura mater* a little below the level of the upper border of the

petrous temporal, passes beneath the petroclinoid ligament in Dorello's canal at the side of the *dorsum sellæ* and enters the cavernous sinus.

The explanations given for this paralysis are three: (i) A periostitis of the tip of the petrous wedge (*apicitis*). (ii) A localized meningitis of the *dura mater* at the petrous tip; this may be serous, as cases clear up without operation. (iii) A toxic condition comparable to retrobulbar neuritis. A case has been seen with double sixth nerve involvement from a single mastoiditis.

Ruskin states that the earliest sign of involvement of the petrous bone, preceding the suppurative state, is disturbance of circulation in the venous network of the bone: (i) congestion of the inferior petrosal sinus, with involvement of the sixth nerve and orbital pain from the *nervus tentorius*; (ii) congestion of the pterygoid plexus, with oedema of the lower eyelid, temporo-maxillary orbital pains and trismus. There is an irregular temperature.

Von Voorthuysen describes as a sign of petrous involvement tenderness over the inferior surface of the apex of the pyramid, as elicited by the finger in the epipharynx behind the Eustachian cushion.

The bacteriological flora of this condition is the *Streptococcus mucosus capsulatus*.

Radiological examination by the Stenvers technique, or with the patient in the gargoyle position, will demonstrate the amount of aeration of the bone and the sites of the cells, the degree of decalcification and loss of trabeculation. It is advisable to have the petrous temporal examined by X rays whenever the mastoid is of this extensively pneumatized type.

Recovery occurs with drainage into the middle ear of the contents of the galleries of cells. On the other hand, the condition may terminate in: (a) leptomeningitis, (b) cerebral or cerebellar abscess, (c) lateral or retropharyngeal abscess.

Treatment.

The occurrence of pain behind the eye in the presence of suppuration in the middle ear should be regarded as evidence of petrositis.

Paralysis of the sixth nerve *per se* is not an indication for an operation upon the petrous cells, and absence of this sign is no indication that petrositis is absent.

Operation is indicated in the following circumstances:

1. When meningeal signs, increase in headache, torpidity, irritability, neck rigidity and vomiting appear and increase.
2. When radiological evidence shows an increase of disease in the petrous bone.
3. When the Kopetzky latent period coincides with decrease of discharge from the middle ear. The amount of discharge is important. If the discharge is free and not associated with aggravation of the symptoms, we may take it that the pus has found a channel of exit. If there is a sudden cessation of discharge, it may indicate that the wall of

the petrous temporal has been perforated, and that the pus is leaking into the extradural space.

4. When there is evidence of septicæmia.

5. When an increase in the local symptoms is noted.

Methods of Approach in Operation.

There are two routes of approach to the apex of the pyramid: from above or from below.

The Superior Route.—Freckner exposes and defines the arc of the superior canal and breaks through the softer bone filling the concavity of the loop in the direction of the apex.

The method of Eagleton—"unlocking the petrous temporal"—provides a method of approach to the cells lying posteriorly. It consists in: (a) Free exposure of the bend of the lateral sinus. (b) Removal of the "solid angle" above the sinus to free the superior petrosal sinus in its groove. (c) Removal of the squama and the petrous until the superior and horizontal canals are exposed.

The cells abutting anteriorly toward the *cavum Meckelii* would be exposed by the Hartley-Krause operation for removal of the Gasserian ganglion. Removal of the outer wall of the attic and the squama of the temporal above and forwards, with elevation of the *dura mater* over the petrous, would provide access to the apex and enable the galleries to be traced from the middle ear.

The Inferior Route.—The inferior route, as described by Kopetzky and Almour, for approach to the infracochlear cells requires a complete radical mastoid operation, with removal of part of the root of the zygoma and the anterior wall of the meatus. A small burr is then driven into the bone just posteriorly to the Eustachian orifice and directly below the tympanic roof. It is directed upwards and is in the small space between the cochlea posteriorly, the carotid canal in front and the Eustachian tube externally.

Ramadier opens the carotid canal in search of the Eustachian peritubal cells.

Summary.

1. A large proportion of persons with pneumatized mastoids have a similar cell formation in the petrous portion of the bone.

2. In an acute inflammation of the mastoid antrum such cells and galleries of cells are frequently involved, particularly in streptococcal infections.

3. Inadequate drainage or virulence of the infection may cause osteitis, rupture into the extradural space, meningitis, cerebellar or cerebral abscess, and possibly thrombosis of the petrosal and, subsequently, lateral sinuses. It is probable that late complications of efficiently treated acute mastoid conditions in pneumatized temporal bones are due to this sequence of events.

4. The Kopetzky latent period and often Gradenigo's sign, with severe pain behind the eye, are indications of the condition.

5. The routes of approach to the petrous cells are indicated.

Bibliography.

- M. C. Myerson, H. W. Rubin, and J. G. Gilbert: "Improved Operative Technic for Suppuration of Petrous Apex", *Archives of Otolaryngology*, XIX, June, 1934, page 482.
H. Kisch: "Petrositis: Review of Recent Work", *Journal of Laryngology and Otology*, LI, April, 1936, page 247.
F. W. Watkyn-Thomas: "Treatment of Petrositis", *Journal of Laryngology and Otology*, LI, April, 1936, page 252.
S. J. Kopetzky: "Problems Concerned with Empyema of Petrous Apex", *Archives of Otolaryngology*, XVIII, July, 1933, page 47.
S. J. Kopetzky and R. Almour: "Suppuration of Petrous Pyramid: Pathology, Symptomatology and Surgical Treatment", *Annals of Otology, Rhinology and Laryngology*, XL, June, 1931, page 396, and September, 1931, page 322.

Reports of Cases.

THE EARLY DIAGNOSIS OF TETANUS.

By MARY C. DE GAKIS, M.D., B.S. (Melbourne),
Geelong.

THE frequency with which fatal cases of tetanus are reported in daily papers suggests that the character and variety of the early symptoms of tetanus are not known to the laity, and not always recognized by members of the medical profession themselves. As early treatment of tetanus is at least as important as early treatment of diphtheria, it seems worth while reporting early symptoms in detail.

IN THE MEDICAL JOURNAL OF AUSTRALIA of March 5, 1932, I reported three cases of supposed early tetanus. To these I wish to add records of two cases of undoubted early tetanus, as well as a subsequent experience of Case III (Mr. X) in the earlier paper. Both latter and former patients gave indications of paroxysmal symptoms, severe out of all proportion to the physical signs, and accompanied by fear and depression; in most cases the onset was asymmetric, and the localization of symptoms peculiar, being a local intermittent pain, stiffness or flutter, tending to become general in the worse cases, though more marked on the injured side. The great exaggeration of the knee jerks and other reflexes, and especially the presence of a jaw jerk (obtained by tapping a finger resting on the chin), are most helpful in diagnosis and in determining the dosage of serum required. All patients responded rapidly to serum, though in Cases IV and V repeated doses were required.

It seems that a reliable diagnosis can be made quite early if attention be given to the reception of an injury within the recognized incubation period, the paroxysmal character of the symptoms, which may be asymmetric at first and very variable from case to case and always accompanied by what appears undue apprehension and fear, combined with great exaggeration of all jerks and the presence of a jaw jerk, together with a response to quite small doses of tetanus antitoxin.

Case III.

I add notes of Case III (reported in the journal of March 5, 1932) as another injury led to another threat of tetanus, which both the patient and I thought a relapse. He sustained his original injury in August, 1930, and was treated with 2,000 units of tetanus antiserum in divided doses. In August, 1934, he suffered an abrasion of the base of his thumb and the wrist of the right hand in a fall. Eight or nine days later he felt a stiffness in both calves, also a "feeling" up both jaws, and occasional pain in arm and leg. There was no exaggeration of jerks. Scabs were removed from the abrasions and magnesium sulphate cream applied, and he was given 1,000 units of antiserum. The next day he was given 1,500 units more, as he had some stiffness in both parotid regions on chewing, and

the right knee jerk was exaggerated, the left being normal. The stiffness now cleared up; but he had some shooting pains on the right side of the back and neck, and he once had a tremor in the right cheek when the jaw jerk was being tested for. No more antitoxin was required.

Case IV.

B., a male, a commercial traveller, aged thirty-seven years, married, was first seen on May 18, 1934. He gave a history of being liable to "eczema" of the scalp. Six days earlier he had grazed the top of his head on a box tree while out shooting. Two days later it had felt very sore, and the next day the eyes were bloodshot, and he felt very sore down the back of the neck, which was now very itchy. On examination, there were some reddish areas on the scalp, rather like flat pimples, and some swelling of glands about and behind the ears, and slight swelling of the eyelids. There was good jaw movement. There was no toothache. The condition was regarded as a "sensitiveness" and treated accordingly.

He was seen again on May 24, 1934 (eleven days after the first injury), when he complained of stiffness in the arms and neck, and a little in the left leg, some swelling of fingers and pain in the interphalangeal joint of the left thumb, and a red area near the left knee. The scalp looked much better, as also the swelling behind the ears (this completely subsided, he said). He had some toothache at this time. Stiffness in the left jaw the previous night had made it difficult to eat. It was painful to open the jaw. The stiffness was apt to come and go, though it was constant down the front of the left elbow; it had begun twenty-four hours previously. On May 22 his illness had begun with depression as if something dreadful was going to happen (he had noticed this when motoring to and from Melbourne). The stiffness had begun on May 23. On examination, the pulse rate was 104 per minute and the temperature was 37.5°C . (99.2°F .); the knee jerks were much exaggerated, especially the left; there was a red swelling under the right arm. I gave him 5,000 units of tetanus antitoxin. At this stage the patient told me that tetanus was prevalent in the district where the injury occurred, and that after hurting himself he shook hands with a man who was handling a dead sheep (cause of death unknown) and that he had subsequently rubbed his head owing to the irritation. It thus appears that the infection may have been incidental to the original injury and not directly from it. Eight hours later he felt neither better nor worse; he complained of shivering; the knee jerks were still exaggerated; arm jerks were obtained, and also a slight jaw jerk; the temperature was 37.25°C . (99°F .) and the pulse rate 96 per minute. He was given another 5,000 units of antitoxin.

On May 25, 1934, the pulse rate was 80 and the temperature 38.5°C . (97.6°F .). The deep jerks were less active and the jaw jerk was hardly obtainable. The pain in the left thumb was much easier; but there was still pain in the upper part of the arms and the back of the neck. He was given another 5,000 units of antiserum. He was seen later in the day by Dr. T. J. M. Kennedy (on behalf of his employers), who concurred in the diagnosis and thought more antitoxin would be necessary.

On May 26, 1934, he felt "pins and needles" in both palms and fingers, lasting for a few seconds at a time. He had lost his feeling of depression. The left knee jerk was greater than the right; ankle jerks were present; there was no jaw jerk.

On May 29, 1934, he said that he had waked with a "jump" two or three times during the night. He had noticed a "flutter" in the right leg and in the arms and a pain in the left forearm and back on the previous day. He was given 5,000 units of antiserum.

On May 30, 1934, a recurrence of the depression had lessened. The "flutter" had gone; but there was still pain in the left forearm, and there was some pain over the heart. The tendon jerks on the left side were decidedly more active than on the right side. He was given 5,000 units of antitoxin.

On May 31, 1934, he looked and felt more cheerful; but he still had pain in the left arm and forearm, and, on the previous night, in the right arm.

On June 1, 1934, he had lost the pain in the right arm and left forearm, but still had pain in the left arm. The left knee jerk and ankle jerk were greater than the right. He sat up for ten or eleven hours.

On June 6, 1934, he said that he had had a very bad night, suffering from pain over the heart and in the right thumb. There was no jaw jerk; the other jerks were active. He was relieved by bromide. He was given 5,000 units of antitoxin. He had felt very well the day before this recurrence.

On June 8, 1934, the ankle jerks were exaggerated; the others were normal. Pain in the right thumb was continuous; pain in the left thumb and in the arm had been intermittent.

On June 11, 1934, the ankle jerks were rather exaggerated, the left more than the right. There were redness and swelling of the right tonsil and the palate.

"Amytal" and bromide were given as sedatives during his illness. He had 30,000 units of antitoxin throughout the illness, and took the precaution of carrying some with him when he resumed work some days later, though he did not require it. He had no more trouble with the tetanus and quite recovered from his nervousness, though troubled with pains in the elbows for a long time.

Case V.

The patient was a trained nurse, single, near fifty years of age, seen first on November 6, 1935. Two days earlier pain had begun across the small of the back; it had become worse on November 5 and again on November 6. The pain was felt only on moving, and shot into both buttocks and down into the left knee, but was constant in the left thigh and buttock. She had spasms in which the back stiffened and stretched back and she called out. She was able to chew well. There was no history of injury. Four days earlier she had helped to lift a boiler and had planted some seedlings; she had also cut her corns. On examination the pulse rate was 76 per minute and the temperature 35.9°C . (96.6°F .). Her speech was ready. The knee jerks were active; a chin jerk was present. She screamed with pain on movement. I took her to hospital and she was able to walk to a car; while in the car she had a mild opisthotonic attack, and the chin jerk increased in activity. On the same day she was given 30,000 units of tetanus antitoxin in three doses of 10,000 units each, spaced at intervals of some hours. After the first 20,000 units she had some stiffness in the back but none in the jaws; there was much exaggeration of the knee jerks and the chin jerk.

On November 7, 1935, 10,000 units were given, and on November 8, 1935, 10,000 units. She felt relaxed; but there was still a jaw jerk (lessened); there was also a lessened activity of the knee jerks. She had a slight spasm in the left buttock in the morning.

On November 9, 1935, there was slight stiffness in the neck, the jerks had all lessened, and there was no more spasm; but there were still an ache in the buttock and stiffness in the neck. She was given a further dose of 5,000 or 10,000 units. On November 10, 1935, another dose of 10,000 units was given, as a small spasm in the left buttock made her call out; the jaw jerk and knee jerk were much exaggerated. On November 11, 1935, she was given 10,000 units. She developed a big serum reaction, for which calcium lactate was given. She had lost the pain in the buttock, and the activity of the jerks had lessened. She had a "bruised" pain and a tender point over the dorsal vertebrae. Chloral and potassium bromide were administered on November 12, 1935. On November 13, 1935, the jaw jerk could still be elicited. There were no more spasms nor ache in the buttock. On November 15, 1935, she was given 2,500 units. There were two spasms in the gluteal region, joint pains and aching in the calves. The jaw jerk was active.

She was allowed out of bed on November 20, 1935. Up to this date the ward records showed that 82,500 units had been given (my records showed 77,500).

On November 27, 1935, the chin jerk was present and sedatives were increased. On November 28, 1935, I saw her at home. She was able to walk with some stiffness; there was a little aching in her back. She was still taking chloral and potassium bromide. There was a slight jaw jerk; the other jerks were normal.

On December 4, 1935, she complained of pain in the left buttock and thigh on movement, and a little pain in the right elbow, and depression. There was no chin jerk. "Luminal" was given in a dose of 0.6 gramme (one grain). On December 5, 1935, she still had pain in the left buttock; the jerks were exaggerated; 2,500 units of antiserum were given.

On December 6, 1935, there was an extensive local reaction to the antitoxin. On December 7, 1935, she was able to move more freely; there was a slight tremor when the jaw jerk was being tested.

On December 10, 1935, she performed some domestic duties. The knee jerks and arm jerks were still active; but there was no jaw jerk. She complained of momentary "needle" pain in the back and "pins and needles". On December 14, 1935, she was given 1,500 units at her own request, as the pain in the back was troubling her. On December 23, 1935, there was no jaw jerk. Her progress was uneventful after this.

In all cases the serum used was obtained from the Commonwealth Serum Laboratories.

Reviews.

ENDOCRINOLOGY.

"ENDOCRINOLOGY IN MODERN PRACTICE", by Dr. William Wolf, is an interesting work.¹ That one man is responsible for it, and that the subject matter for each section is in tune with recent research in a subject of which knowledge is being so rapidly accumulated, is little short of amazing. It is a type of work that might be expected from a team of workers, yet the author gives his address vaguely as New York City, claiming no clinic or hospital as the field of his work.

This book may be regarded as a correct statement of modern knowledge. The work is divided into sections, the first of which is devoted to the study of the glands separately. Each gland is discussed under the following headings: Anatomy, embryology, histology, physiology, and interrelation with other glands; then follows a description of diseases of the gland.

This offers what is difficult to find elsewhere in the literature of endocrinology—a possibility of approach to the subject from basic principles and facts on towards modern theory and therapy; for as one reads, the basis of therapy is made very evident. The description of the ovarian functions will render simple to the reader many of the ways in which trade preparations should be used; and some accurate knowledge such as is contained in this portion of the book should be acquired to prevent the indiscriminate use of preparations advised daily in the mass of literature brought to the doors of the medical profession. An excellent list is given in one section of all the trade products, the maker's name, constituent and dose being stated. The dose must be taken into consideration with the price, as two preparations of almost similar price may vary considerably in the amount of hormone that they contain.

In the section entitled "The Endocrine Aspects of Non-Endocrine Diseases" the author remains orthodox, but the whole section will probably worry the clinician who endeavours to remain sane on all subjects and apportion blame where it is due. This section may be interesting

from the point of view of the future of therapy, but at present must be treated purely on its merits. For example, on page 643 the following appears: "Enuresis when not due to organic causes, may be traced to thyroid or pituitary underfunction." With this statement not all will agree.

A plea must be made for a revision of nomenclature. Were one name to be given to a hormone, then each trade house could make preparations under that name and allow its preparations to stand test against those of other houses. Wolf in this book had a wonderful opportunity of initiating a reform, but he has followed the usual multiplicity of names. In this way he has made his book difficult for the busy clinician to read.

The laboratory means whereby these substances may be isolated are detailed, the book thus being made a complete compendium of endocrinology.

With a little revision and collaboration this work could easily become a standard text-book which would require little else from time to time than addition.

Notes on Books, Current Journals and New Appliances.

REGIONAL ANATOMY.

In our issue of January 19, 1935, we commended to readers the first five sections of an atlas of anatomy published by Dr. E. B. Jamieson, Senior Demonstrator and Lecturer in the Department of Anatomy of the University of Edinburgh.¹ The five parts covered the central nervous system, the head and neck, the abdomen, the pelvis and the thorax; 103 plates were included in the five parts. Dr. Jamieson has now published Sections VI and VII, dealing with the upper and lower limb respectively. The former contains forty-two and the latter fifty-two plates. The standard of the work is maintained, and, as before, the names used in the legends are those approved by the Anatomical Society at Birmingham in 1933; in some instances the Latin forms of the "B.N.A." are added in brackets. By adding these two sections to the previous five Dr. Jamieson has produced a valuable atlas of the body.

A MEDICAL DICTIONARY.

The thirteenth edition of Stedman's "Medical Dictionary" has appeared.² With this edition it celebrates its twenty-fifth anniversary. This is an excellent book and one that we have found of great assistance in our everyday work. The work is, of course, American, and American spelling is used throughout. In this edition the editors have seen fit to follow the example of the editors of the United States Pharmacopoeia and National Formulary in substituting the chemists' spelling sulfur for sulphur. This will offend the eye of many British readers. With this single exception we have been able to find nothing in the book at which we can cavil. No person who speaks or writes English can afford to be without a good English dictionary constantly at his elbow; similarly, no medical practitioner who wishes to remain a student can do without a good medical dictionary. Stedman's work will meet his needs.

¹ "Illustrations of Regional Anatomy", by E. B. Jamieson, M.D.; Section VI: Upper Limb (containing 42 plates); Section VII: Lower Limb (containing 52 plates); 1936. Edinburgh: E. and S. Livingstone. Double foolscap 8vo. Price: Section VI, 7s. 6d. net; Section VII, 10s. net.

² "A Practical Medical Dictionary", by T. L. Stedman, A.M., M.D.; Thirteenth Revised Edition; 1936. London: Baillière, Tindall and Cox. Royal 8vo, pp. 1303, with illustrations.

¹ "Endocrinology in Modern Practice", by W. Wolf, M.D., M.R., Ph.D.; 1936. Philadelphia: W. B. Saunders Company; Melbourne: W. Ramsay. Royal 8vo, pp. 1018, with illustrations. Price: 63s. net.

The Medical Journal of Australia

SATURDAY, JUNE 12, 1937.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

MEDICAL PRACTICE IN QUEENSLAND.

EVERYONE will agree that the organization of society is continually changing. In some countries the changes are more deeply rooted and more widespread than in others, presumably because the people in one place feel a greater need for reform than those in another. The members of the medical profession, as integral parts of the community, should take a share in shaping its destiny, in other words, in determining its needs; but as servants of the community in the matter of health, they must organize their service to meet the requirements of their fellow citizens. Neither individually nor collectively can medical men and women afford to neglect this twofold duty. The drones in a society must degenerate; moreover, instead of carrying a suitable burden of their own choosing—for all members of society must bear part of its burden—they will either be overloaded by the ignorant or be given tasks that will not lessen the common burden.

The Hospitals Acts, 1936, The Health Acts' Amendment Act of 1936 and the Local Government

Act of 1936 mark an important stage in the changes that are taking place in medical practice in Queensland. Some of this legislation was discussed in this journal on January 2, 1937, when it was pointed out that one of its possible results was the denying to the patient of the right to choose his own medical attendant. Unfortunately these laws confer great powers on boards composed of non-medical persons and on permanent officials, and the practising members are not represented on boards of management. It remains to be seen what the outcome will be. Already the new acts have precipitated the preliminary steps in the reorganization of the staff of the Brisbane General Hospital. A joint committee of the honorary staff and of the board of the hospital is at present drawing up a scheme for the appointment of full and part-time officers to the staff; the cooperation of the Faculty of Medicine of the University of Queensland is being sought so that sound clinical teaching may be provided for undergraduates and provision may be made for post-graduate study. In other words, the honorary system will soon cease to exist in the Brisbane General Hospital.

The welfare of the patient is and must always remain the first object of all forms of medical practice. The Queensland Branch of the British Medical Association, with this objective in mind, has, as most readers of this journal know, drawn up a scheme for the establishment of a health service in Queensland. For the effective working of any health scheme cooperation between the government and the medical profession is necessary. The Queensland Branch of the British Medical Association believes its scheme to be sound. Though it has not been altered in any way since it was adopted by the Branch in February, 1935, it embodies the principles laid down last August by the Federal Council of the British Medical Association as those that should govern a State medical service (see *THE MEDICAL JOURNAL OF AUSTRALIA*, September 19, 1936); and the same principles are embodied in the policy of the Parent Association in Great Britain (see the Supplement to *The British Medical Journal*, April 26, 1930). If effective cooperation between the Government of Queensland and the

Queensland Branch of the British Medical Association is to be obtained, the members of the Branch must be united and alive to the necessities of the occasion. Steps are shortly to be taken to promote that unity and to make members enthusiastic about the advice and cooperation that they are willing and anxious to give the Government in the creation of a worth-while medical service for the State. Dr. J. G. Hunter, the General Secretary of the Federal Council of the British Medical Association in Australia, will shortly go to Queensland; he will visit the principal centres with a member of the Branch Council and will not only assist in organizing the profession, but will elucidate and expound the Branch policy. It is hoped that Sir Henry Brackenbury, who is going to New Zealand in September to advise the New Zealand Branch on the subject of national health insurance, may be persuaded to visit Queensland. Sir Henry Brackenbury was formerly Chairman of the Council of the Parent Association and one of the foremost authorities on national health insurance; his advice and help would be invaluable to the Queensland Branch.

The Council of the Queensland Branch is anxious that members shall take a lively interest in the doings of the Council. The greatest stumbling block to achievement in the Australian Branches is often apathy of members. Fortunately enthusiasts do exist; it is for each enthusiast to try to spread his enthusiasm to at least one other member; and the appeal should always be made from the highest motive, that of the welfare of the public.

Current Comment.

ARTHRITIS IN WOMEN.

A LECTURE delivered in April, 1936, by R. Fortescue Fox, President of the International League against Rheumatism, to the Institute of Hygiene, London, was given the title of "Arthritis in Women: A Clinical Survey".¹ As a consequence of his well known propaganda on behalf of international action against the rheumatic disease, Dr.

Fox must always be heard with respect and attention. When he chooses to enter the clinical field he is able to draw upon the experience of a long contact with rheumatic sufferers of all types. In this instance the replies to a *questionnaire* concerning arthritis in women which was addressed to well known students of rheumatism of both Europe and America are appended to the views of Dr. Fox himself. It is remarkable to observe how closely these coincide with each other.

After a few general remarks upon the prevalence and disabling character of rheumatism among young and middle-aged women, especially of the northern European countries, the author distinguishes three different clinical forms of the disease. First, there is the serious, acute and disabling arthritis affecting married women, especially in the thirties and forties, to which Sir Alfred Garrod, in 1858, gave the name of "rheumatoid arthritis". Some authorities in England and America prefer to call this condition "infective arthritis". While general infection, such as that of scarlet fever, gonorrhoea and so on, can and does cause arthritis, while focal infection, such as is benefited by the removal of infected teeth or tonsils, can act as a cause, nevertheless no one form of infection either general or local has been proved to cause rheumatoid arthritis. The belief, however, is gaining ground that this form of arthritis of the young actually is a specific infective disease, comparable with malaria or tuberculosis, and due to the invasion throughout the body of some unknown virus or microorganism. It is not impossible that it is allied to, although quite distinct from, what is still known as "rheumatic fever", although it invades a different set of tissues and never affects the heart. The disease frequently has an insidious onset, often with remissions. The earliest symptoms are a sense of chilliness, "the cold body and icy hands", general pains, ready fatigue, localized pigmentation and perspiration. Loss of appetite and constipation are frequent, while enlargement of lymph glands and spleen, with an increase in sedimentation rate, is frequently discovered if looked for. There is little doubt that unexplained disturbances of the peripheral circulation with contraction of the arterial and capillary bed are an important factor in the pathology of rheumatism. The spread from the fingers is centripetal or ascending. As the disease proceeds from joint to joint it leaves a trail of permanent injury. Movement is rapidly lost. There is severe pain in the nerves and muscles unconnected with the affected joints. The pain is unaffected by season or weather. Three clinical stages may be detected—invasion, atrophy and deformity. The average age of onset in thirty-two patients was twenty-two and a half years—a period of catarrhs, tuberculosis, hyperthyroidism and of nervous and physical strain in many women. A family predisposition is sufficiently common to receive mention.

Fox's second type of arthritis in women is the so-called "climacteric arthritis". This group con-

¹ "Arthritis in Women (A Clinical Survey)", by R. F. Fox, M.D., F.R.C.P., F.R.Met.Soc., 1936. London: H. K. Lewis and Company Limited. Royal 8vo, page 36. Price: 2s. 6d. net.

tains many mixed types, with features of the acute juvenile form on the one hand and the degenerative arthritis of the old on the other. It differs from the serious rheumatoid variety of the young in the mode of onset, the order in which the joints are affected, its more favourable course and its occurrence in comparatively healthy people. The average age of onset is about forty-eight years. Women are affected five times as frequently as men. There may be periods of quiescence amounting to one or two years. It occurs at a period of frequent breakdowns in the circulation, in mentality, in the digestive organs, and particularly in metabolic processes, such as the carbohydrate metabolism. Married women are affected more frequently than single. Hypothyroidism and obesity are certainly factors in some patients, especially those with flat-foot. Accidental infection may turn the balance, but there is no proof of actual septic invasion.

The third group is osteoarthritis and belongs to the age period over fifty-four. It generally begins insidiously in a single large joint, hip, shoulder or knee. It consists, as far as the joints are concerned, of a speeding up of the normal processes of involution. No "normal" knee joint, for example, is free from some degree of these changes after sixty-five. Osteoarthritis in women, as the Ministry of Health inquiry showed, is extremely common after fifty. It may remain a purely local arthritis, become generalized and subacute, or consist only of "knobby" fingers. The last mentioned is commonly seen in elderly women of rheumatic families.

Fox goes on to a discussion of the various factors which have been suggested as causes for rheumatism. He holds that the "soil", not the "seed", is mainly responsible, especially when debilitated by previous illnesses or mental strain. "It is questionable", he writes, "whether rheumatoid disease ever attacks a healthy person." He believes that either sudden or repeated chill is more immediately concerned than any other exciting cause with all forms of rheumatism. In this regard, he draws attention to the frequency of bad housing as the background for rheumatism, and draws attention to the much longer hours spent indoors by the housewife as compared with other members of the family.

Treatment is briefly discussed. He states the objects of treatment to be the relief of pain, removal of gross sepsis, rest, right feeding, reestablishment of normal warmth, circulation and joint movement. In rheumatoid arthritis it is refreshing to note that this authority can see no reason to forbid any kind of food that the patient can relish, including plenty of glucose and carbohydrate. Rest in bed for six months with daily massage to the muscles, hot baths and local counter-irritants are advised, with support of the inflamed joints in the well known optimum positions. Gentle movements of the joints after ten to fifteen minutes in a foot bath should be given as the pain subsides. Preparations of cod liver oil and arsenic are also called for at this phase. Climacteric arthritis needs curbing of food excess, dieting and even periods of fasting,

saltines and increase in water intake. The use of semi-solid compresses, peat or estuary mud, hot sulphur pools and manipulation later on are all referred to with approbation.

In a postscript, Dr. Fox displays the moral of his lecture, namely, the urgent need for the provision in England (and elsewhere) of what he calls "rest houses for rheumatoid arthritis", where young women in the pre-arthritis or early stages of rheumatoid arthritis can be observed and treated for an indefinite period or periods. Such institutions are not provided for by public hospitals and the ordinary convalescent homes. Open air, good food, freedom from the petty but unending house duties, proper rest periods, and even some physiotherapeutic equipment would all be available for the tired sufferer. Analgesic measures, such as radiant heat, mud packs, hot brine or mustard baths applied under the direction of a specially qualified medical man or woman, should be possible. There should be a trained staff of nurses with massage experience. The locality must be chosen with care and yet be within easy reach of the city.

There is little need to add that Dr. Fox will succeed in his appeal, but the plan should not be limited to England. The need may be greater in Europe, but there is no question but that rheumatoid arthritis in women is sufficiently common in Australia to require a complete organization similar to that which should exist for tuberculosis and for cardiac rheumatism. The public hospitals are badly equipped to handle this disease, which, insinuating itself into the boundary between the physician and the orthopaedist, creeps steadily towards irrevocable invalidism. To our knowledge, no hospital in Australia possesses a modern therapeutic pool, a fundamental of the anti-rheumatic armamentarium. There is no talk of a properly organized rheumatic clinic, in spite of the unqualified success, clinical and financial, which has attended such institutions in Europe and America. No one has yet computed the industrial loss in Australia through rheumatic disease. It is to be hoped that the National Health and Medical Research Council will turn its early attention to the establishment of a committee of inquiry in rheumatism in Australia in all its phases.

THE ADELAIDE CONGRESS.

In a few short weeks the fifth session of the Australasian Medical Congress (British Medical Association) will begin at Adelaide. Those who are preparing papers for presentation before the several sections are doubtless putting the finishing touches to their communications. In order to facilitate the editorial work in connexion with the congress numbers of this journal, and because most of the papers will subsequently appear in its pages, authors of papers are asked to have their contributions carefully typewritten in double spacing, with a wide margin. Single spaced copy will not be accepted.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Operation for Entropion.

F. W. GODDARD (*The Chinese Medical Journal*, October, 1936) describes an operation for entropion which he has found invariably successful. The lid is everted and five or seven half-curved needles threaded on a silk suture twenty inches long are passed between the cartilage and the skin; the needles enter at the upper border and emerge near the ciliary margin. An incision is then made from one palpebral angle to the other through the entire thickness of the cartilage, the needles preventing the knife from penetrating too deeply. The needles are now drawn through and the loops of suture are cut at convenient lengths for tying, the cut ends being tested and clamped in pairs. The lid is returned to its normal position and the sutures are tied to secure a little over-correction. They are left in for eight to ten days.

The Differential Diagnosis of Orbital Gumma.

E. WOLFSOHN (*British Journal of Ophthalmology*, November, 1936) refers to an instrument called the piezometer, an apparatus by which can be measured the displaceability of the eyeball into the orbit. It is built along the same lines as a tonometer, and is placed on the cornea. A weight of twenty-five grammes is added and an indicator marks off on a scale in tenths of a millimetre the displacement of the eyeball into the orbit. Values have been obtained for the piezometric displacement in cases of fibroma, sarcoma, carcinoma and angioma of the orbit, but so far only one reading has been made in the case of gumma of the orbit. A woman of sixty-four had congestion of the left eye with exophthalmos. She admitted having had syphilis thirty-four years previously. During the course of anti-syphilitic treatment the piezometric value diminished, and this was thought to indicate resorption and cicatrization of the retrobulbar lesion and to contribute to the diagnosis of syphilis.

Iridectomy with Cyclodialysis in Glaucoma.

J. M. WHEELER (*Archives of Ophthalmology*, October, 1936) recommends cyclodialysis combined with iridectomy only in desperate cases of glaucoma that have failed to respond to other measures. The upper temporal and lower temporal regions are favourable sites for operation. A large conjunctival flap is dissected up to the limbus. A scleral incision three to four millimetres and eight to ten millimetres from the cornea is made; through this a sturdy angulated

spatula is passed beneath the sclera and along the posterior surface of the cornea nearly to the pupillary margin. By rotating the handle of the spatula the separation of the uvea from the sclera and cornea over a wide area is effected. The conjunctival flap is then lifted up and a keratome is inserted into the anterior chamber, an incision large enough for a wide iridectomy being made. The iris is cut off at its attachment to the ciliary body. The conjunctival wound is sutured. There is usually some hæmorrhage, and the keratome incision is difficult in the soft eye. Out of fifty-seven eyes operated upon, thirty-one preserved low tension. Eight eyes were enucleated.

Cataract Extraction through a Vertical Conjunctival Slit.

W. MOEHLE (*Archives of Ophthalmology*, October, 1936) describes the extraction of cataract through a vertical conjunctival slit. The conjunctival incision extends downwards to 1.5 millimetres from the limbus and upwards for 20 millimetres. The conjunctiva is undermined to the central meridian of the cornea, both at the temporal and nasal extremity. Sutures are placed in the conjunctiva on each side of the incision; they serve to separate the two flaps, also for upward traction. The cornea is now incised with a keratome. The incision should be made as large as possible by carrying the keratome well down in the anterior chamber and using the cutting edge on each side on withdrawal. The incision is further enlarged with a snip or two with de Wecker's scissors. The iridectomy is done in the usual manner, capsulotomy is performed and the lens is expressed. Cortical remains may be removed with an irrigator. The fixation sutures are withdrawn and the conjunctiva falls together without further suturing.

Lid Papillomata Treated by Electrolysis.

THE use of the electrolysis needle in the removal of lid papillomata converts a difficult operation to one of simplicity. J. Minton (*British Journal of Ophthalmology*, November, 1936) describes his technique. The galvanic current required can be obtained from a multostat or pantostat run off from the mains, or from a box of dry batteries. The same machine may be used for electrolysis in epilation of lashes and also for the catholysis treatment of retinal detachment. The positive flat electrode is attached to the patient's arm; three to four milliampères of current are required. After local anaesthesia is obtained the needle is inserted through the base of the tumour and transfixes it; the current is turned on and bubbling appears. After a few seconds the needle is withdrawn and the tumour is transfixed in several other directions in turn. The papilloma may be left to fall off, or preferably snipped with scissors. If the needle

is left in too long, or the current is too strong, scarring of the lid may follow. The same method applies to other local conditions, such as small sebaceous cysts of the skin, xanthomata, calcareous secretions and granulomata after squint operations or enucleation. The method is bloodless.

Treatment of Angina of the Eyelid by Injection of Sclerosing Solutions.

B. MALKIN (*Archives of Ophthalmology*, October, 1936) reports his experience of treating vascular tumours of the eyelid by the injection of sclerosing solutions. A child of three months presented a red, soft tumour of the left upper lid, measuring 15 millimetres in length. Into the growth 0.25 cubic centimetre of quinine and ethyl carbamate was injected, and four days later 0.5 cubic centimetre of the same fluid. The mother reported later that the lump had disappeared. A girl of nine years had an angioma involving the outer two-thirds of the right eyebrow. She was given four injections of 2.0 cubic centimetres of 12% quinine dihydrochloride and three of 10% sodium chloride. Five months later injections were repeated with good result. A third patient, a girl of five months, was treated by injection of 0.5 cubic centimetre of a 15% solution of quinine hydrochloride. She is still under treatment. The method is safe, and treatment by its means is easily carried out.

Bifocal Spectacles.

WHEN the eye is lowered from the distance to the reading segment, objects appear to be displaced downwards. This, according to F. A. Williamson-Noble (*The British Journal of Ophthalmology*, August, 1936) is due not so much to the different power of the two segments as to the centring. By incorporating a prism, base up, in the reading position this jump can be eliminated. The centres of the two parts will coincide at the dividing line.

OTO-RHINO-LARYNGOLOGY.

Some Remarks on the Surgical Treatment of Peritonsillar Inflammations.

REIDAR SCHROEDER (*The Journal of Laryngology and Otology*, September, 1936) describes the treatment of peritonsillar abscess. Fifty-six patients with peritonsillar abscess were treated by detachment of the upper pole of the tonsil, with partial or total tonsillectomy, in order to get complete evacuation of the pus as soon as possible. The operations were all performed under local anaesthesia, which, among other advantages, has that of stopping the trismus. The author states that the result of these proceedings is very good; it is not proved that the procedure gives a less satis-

factory post-operative course than incision. The frequency with which cases of peritonsillar inflammation are complicated by parapharyngeal abscess is noted.

Effect of Zinc Ionization and Galvanic Current on the Reaction of the Nasal Mucosa to Vasomotor Drugs.

W. F. WENNER AND J. H. ALEXANDER (*Archives of Otolaryngology*, December, 1936) discuss the effect of zinc ionization and galvanic current on the reaction of the nasal mucosa to vasomotor drugs, and conclude that changes in the nasal mucosa following zinc ionization do not hinder the absorption of vasomotor drugs instilled into the nasal cavity. The blood vessels and the cavernous tissue of the nasal mucosa fail to react to vasoconstrictor and vaso-dilator substances for six weeks after zinc ionization, and for four weeks after treatment with the galvanic current. This failure of the vascular structures to become constricted or to dilate is due either to a temporary paralysis of the vasomotor nerves or to a loss of vascular tone. Histological study of the blood vessels, however, showed no thickening or other pathological change in the walls of these structures that might account for this temporary disturbance of the vasomotor mechanism.

Osteomyelitis of the Skull of Otitic and Paranasal Sinus Origin.

HERBERT C. BEHRENS (*Archives of Otolaryngology*, March, 1937) discusses osteomyelitis of the skull and gives his conclusions drawn from the literature and cases reported. In the majority of cases osteomyelitis of the skull follows surgical intervention and is also more serious from a prognostic standpoint than that which arises spontaneously. The insidious onset, masking the real gravity of the disease, is emphasized. A surgeon should never operate on the sinuses unless the indications are clear-cut, but when necessary he should operate promptly and obtain adequate exposure for good drainage. Nutrition of the bone should be respected and pus or necrotic material should not be left confined. It is wise to avoid the use of any instrument that rubs infected material into the rough edges of bone, such as the rasp or the curette. Differences of opinion, with a multiplicity of suggestions as to treatment, are noted in literature on this subject. Some observers feel sure that early radical treatment offers the only hope of saving the patient, while others are just as sure that conservatism will be successful. It is impossible not to believe that a great share of this difference of opinion is due to the fact that conservative surgeons have happened to deal principally with the slower localized type of osteomyelitis, while those who advocate radical treatment have treated mostly the rapidly spreading type. If careful study reveals the type of osteomyelitis,

it is possible to act accordingly and to feel that the patient is receiving the best possible care. The treatment falls naturally into three chief types: radical, conservative and medical or supportive, which should be employed in addition to either of the first two. The radical treatment in properly selected cases consists essentially in thorough and wide removal of all diseased bone and a portion of the surrounding healthy bone, drainage of all abscesses, removal of all necrotic tissue and wide open drainage. The conservative method consists essentially in draining abscesses as necessary, of operating only when operation appears clearly indicated, that is, if possible, waiting until acute infection has subsided somewhat and then being content with removal of sequestra and most of the infected bone, of not stripping the periosteum more than necessary, of searching for extradural abscesses, of not curtailing and not incising the *dura mater* until it is certain that there is an abscess of the brain which has become well localized. If possible, the fistulous tract leading to the abscess should be found and drainage should be established through the tract. Supportive treatment consists in: (i) blood transfusions, first and most important, especially immunotransfusions, prepared by injecting killed cultures of the specific organism recovered from the wound into the donor prior to transfusion; (ii) the administration of a 50% aqueous solution of iron and ammonium citrates twice a day, or reduced iron, 0.6 gramme, twice a day; (iii) heliotherapy and the application of ultra-violet and infra-red radiation; (iv) the administration of vaccines and antitoxins; (v) the use of preparations of cod liver oil; (vi) feeding of nutritious, easily digested food; (vii) the application of massage and heat; and (viii) elimination and general hygienic measures. Regeneration of bone in cranial defects is usually good, though it may take several years.

Conduction Deafness.

ANTONIO CIOCCO (*Archives of Otolaryngology*, December, 1936), in a paper dealing with conduction deafness, presents data on the acuity of hearing by bone conduction for 516 patients with a conductive type of impairment. The data have been statistically analysed to determine whether or not the acuity of hearing by bone conduction is related to any of the following items: age, the appearance of the tympanic membrane, tinnitus, a history of familial deafness and the degree of impairment of hearing by air conduction. "Prolonged" bone conduction time was found in 26.7% of the cases, "normal" bone conduction time in 66.1%, and "shortened" bone conduction time in 7.2%. There is a statistically significant age difference between the persons of the three groups. Those with "prolonged" bone conduction time were, on the

average, the youngest; those with "shortened" bone conduction time were the oldest. On the average the acuity of hearing by air conduction of persons with "prolonged" and with "normal" bone conduction time was similar and was more acute than in patients with "shortened" bone conduction time. A normal tympanic membrane was observed with greater relative frequency in persons with "prolonged" bone conduction time, while a perforated tympanic membrane was found relatively more often in those with "shortened" bone conduction time. The incidence of tinnitus was practically the same for each group. The incidence of a family history of deafness was highest in those with "prolonged" bone conduction time and lowest in those with "shortened" bone conduction time. The effect of age on the acuity of hearing by bone conduction appears to be the most noteworthy finding. "Prolonged" bone conduction time in all probability represents the upper "tail" of the frequency distribution of the normal variation. The fact that the persons with such bone conduction were the youngest on the average may be regarded as confirming the hypothesis that acuity of hearing by bone conduction is associated with some factor or factors other than the condition of cochlear nerve and end-organ.

The Problem of Early Laryngeal Tuberculosis.

N. R. BLEHVAD (*The Journal of Laryngology and Otology*, March, 1937) gives his experience as a laryngologist to the Oeresundshospital in Copenhagen and in the Boserup Sanatorium. From 1916 to 1934, 1,773 patients suffering from typical laryngeal tuberculosis have been treated. Of the 1,369 patients who continued under observation, 74% have died and 26% are alive. Every treatment is begun with light baths and orders to keep silent. If there is no appreciable improvement within a few months, local operation is undertaken, provided the condition of the patient does not contraindicate surgical treatment. In the years 1922-1936 there were performed 401 excisions, 527 galvano-cauterizations, 40 amputations of the epiglottis, 127 injections of alcohol, 49 resections of the superior laryngeal nerve. The author's personal experience does not support the view held by some authors of textbooks on laryngology, that phthisical patients who are susceptible to acute laryngitis are especially disposed to laryngeal tuberculosis. He mentions the following changes which give rise to a suspicion of tuberculosis: isolated redness of the vocal cord, swelling and redness of the vocal process, prolapse of the ventricle of Morgagni, swelling of the lower surface of the vocal cords, swelling of the mucous membrane in the interarytenoid region, a red cushion beneath the commissure.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Section of Neurology and Psychiatry and the Section of Medicine of the New South Wales Branch of the British Medical Association was held at the British Medical Association House, 135, Macquarie Street, Sydney, on February 18, 1937.

Syphilis and Neuro-Syphilis Treated by Electropyræxia.

Dr. G. P. U. PRIOR read a paper entitled "Syphilis and Neurosyphilis Treated by Electropyræxia" (see page 895).

PROFESSOR G. C. LAMBIE expressed his appreciation of Dr. Prior's paper, both on account of the large amount of work it represented and because of the restrained manner in which the results were presented.

In view of the generally accepted estimate of the inefficacy of arsenical preparations in the treatment of general paralysis, it was interesting and encouraging to note the improvement in the condition of the patient, and especially the rapidity with which the Wassermann reaction became "negative" when heat was used subsequent to the administration of these remedies. It was also noted, however, that the Wassermann reaction did not become "negative" after the periods during which heat alone was used. As the results were encouraging, it would seem justifiable to study the effects of heat alone throughout the treatment; but this had apparently not been attempted.

In order to obtain clear-cut results and to be able to assess properly the relative value of the remedies employed, it would be necessary to study simultaneously four parallel series of cases, namely, (a) those with no treatment, (b) those with administration of arsenical preparations or other antisyphilitic drugs alone, (c) those with the use of electrical pyrexia alone (not malarial pyrexia), (d) the effect of combining electrical pyrexia with the same antisyphilitic drug therapy as in the previous series.

It was not quite satisfactory to take as a control the normal course of the disease as observed many years previously, before the introduction of malarial pyrexia or antisyphilitic drug treatment. As in dealing with the effect of remedies in any infectious disease, it was necessary to take cases at the same period of the epidemic, no matter whether the epidemic was one of short duration or stretching over a number of years. The virulence of the organism and the resistance of the host varied, and there was no guarantee that in the course of years the virulence of the *Treponema pallidum* and the susceptibility of the racial stock had remained constant. Syphilis was a disappearing disease, and before assessing the value of remedies it was necessary to know by suitable controls, carried out simultaneously with the application of remedies, how far the natural course of the disease had been modified by evolutionary changes in the parasite and in the host.

PROFESSOR W. S. DAWSON wished first of all to congratulate Dr. Prior on his painstaking work and on the critical presentation of his results.

In view of Professor Lambie's comments, he would like to draw attention to Meagher's figures (quoted in detail) based on a review of patients with general paralysis admitted to various mental hospitals in England during 1923-1924 and followed up until 1927. These patients fell into two groups, namely, those admitted to mental hospitals which had not at that time adopted malarial treatment (1,100 cases) and those treated by malaria without antisyphilitics (438 cases). The figures spoke unmistakably for malarial therapy. Further experience indicated that malaria plus antisyphilitics gave even better results. Had malaria any particular action apart from its heat-producing qualities? It would appear that in persons dying during or soon after malaria there was activity in the reticulo-endothelial system in the brain, and it had even been suggested that malaria acted on the principle that "dog eats dog".

Professor Dawson asked Dr. Prior whether he had any similar evidence in regard to electrically produced pyrexia. He felt that he would have to consider Dr. Prior's very detailed results with great care before arriving at a judgement as to the relative merits of malaria and inductothermy in the treatment of neuro-syphilis.

Dr. L. JOHNSTON supported Professor Lambie in saying that syphilis had diminished in late years and that a case of secondary syphilis was seen only about once every six months and a primary case only once every three months. Students had little chance now of diagnosing secondary syphilis, and Dr. Johnston was surprised to hear that neuro-syphilis was increasing.

Dr. Johnston congratulated Dr. Prior and suggested that heat therapy might be tried on spirillosis in fowls.

Dr. S. EVAN JONES congratulated Dr. Prior on the results of his work with the inductotherm. The most important aspect of the pyrexial treatment of neurosyphilis was the emphasis placed on the early diagnosis of general paralysis. The onus was placed on the general practitioner to recognize these cases in the early stages so that the patients might be treated before irremediable damage had been done to the cortex. The incidence of neuro-syphilis was not on the decline, as the admission rate was as high now as it had been before the introduction of "Salvarsan". Every neuro-syphilitic patient should be given the benefit of heat treatment, but it was essential to use arsenic as well. The advantage of electrical pyrexia over malaria was its controllability and its suitability for the treatment of debilitated patients.

Dr. O. LATHAM reminded his hearers of the difficulty of differentiating general paresis histologically from cerebral syphilis and also of the comparative harmlessness of the spirochæte as a direct poisoning agent. The fetal liver might be crammed with spirochætes and show no evidence of this to the naked eye or clinically.

The intima and perivascular coats of the blood vessels and other elements of the reticulo-endothelial system intracranially resented the company of the spirochætes and reacted accordingly, especially the intima; and this tissue hypertrophy and elaboration actually caused hundreds of thousands of minute areas of focal ischæmia, as evidenced by neural degeneration, gliosis, satellitosis and, most important, massive new capillary formation—phenomena also evident in like conditions with other ætiology (for example, arteriosclerosis).

If the spirochætes were removed the elaborated tissues receded and the surviving but damaged neurones recovered and functioned. General paralysis might represent a further degree of reaction than gummatous syphilis, which latter was preeminently curable. Soon after malaria therapy certain mesenchymal reactions took place in the small cerebral vessels, which might open up to circulating body fluids corners harbouring spirochætes. Whether malaria acted by virtue of its toxin or fever was not known, but it was known that the metallic remedies appeared to be also assisted by such body reactions as were caused by intravenous shock therapy, sun-bathing, spinal fluid withdrawal, and especially by heat as induced by electrotherapy. Histological examination of a congenital syphilitic brain treated electrically in Dr. Prior's clinic showed intense vascular engorgement and perivascular hæmorrhages. But the florid glial reactions had not yet receded and the granulomatous vascular conditions still obtained.

Dr. R. J. MILLARD said that he had been especially interested in Dr. Prior's paper because his experience of general paralysis of the insane went back to the days when it was not known to be due to syphilis. At that date the prognosis was death in twelve to eighteen months, generally preceded by a stage of dementia with dirty habits and bed-sores, and punctuated by fits. No treatment of any value was known. Dr. Prior had been a pioneer in the promulgation of heat therapy in this disease, and it was a fitting climax to his long career in the service that he should give this account of his stewardship. Dr. Millard was interested to hear that Dr. Prior considered tuberculosis a contraindication to the use of heat therapy, and wondered why it should be. It occurred to

him that perhaps heat therapy might be used in the treatment of leprosy, unless this also was a contraindication. As regards the use of heat therapy in syphilis other than nerve syphilis, Dr. Millard thought it should be remembered that these cases, primary, secondary and even tertiary, generally responded readily to chemotherapy by mercury, arsenic or bismuth. When heat also was used in the treatment, it should not be given more than its share of credit for the improvement. And who was able to say just what was its share?

Dr. BRUCE HALL asked Dr. Prior whether, in his series of cases, he had had any opportunity of observing any effect of fever therapy on optic atrophy.

Dr. H. C. McDouall congratulated Dr. Prior on his very interesting paper, and considered his research into the treatment of neuro-syphilis by electrothermal methods most useful, as, though malarial therapy had proved efficient, there were obvious drawbacks to its pursuit. Dr. Dawson's table showed what a wonderful improvement of results in neuro-syphilitic treatment had occurred since the introduction of malarial treatment. Dr. McDouall recalled that forty years previously the average duration of cases of general paralysis of the insane, from diagnosis to death, was given as three to four years, but he had found the average duration to be nearer to eighteen months only; and when "Salvarsan" was first used on these cases it appeared only to hasten the onset of death. He was very interested to hear the view expressed that syphilis was becoming less virulent.

Dr. JOHN MCGEORGE said that inductothermy had opened a new path for the treatment of all stages of syphilis. Hitherto various means had been used to induce a therapeutic pyrexia. These included "T.A.B." injections and other forms of protein shock, as well as the use of such agents as a suspension of sulphur in olive oil; but malaria was the only one which survived the test of time until the introduction of electropyræxia. It had been said, and violently contradicted, that the satisfactory results of malarial therapy depended on something more than just raising of the temperature, and that it was possible that the malarial plasmodium produced certain antibodies which had a specific action on the spirochæte. Whether this was so or not, the fact remained that the treatment of general paralysis of the insane by malaria was still largely empirical, and it was interesting to note that three cases at least had been seen in which malaria was contracted between the time of the original infection and the appearance of the mental symptoms. It was worthy of note that so many patients, who were sincere in their attempts to give a complete history of themselves, denied absolutely any signs of a primary sore. This made one wonder whether there might not be a special neurotropic form of spirochæte which resulted in few, if any, external manifestations of the disease in the form of sores and rashes. No matter what the theories might be, however, the fact remained that Dr. Prior's paper was of considerable value in showing how effective and rapid the results could be from the use of a combination of chemotherapy and electropyræxia. It conclusively proved that there was a means of treatment which was definitely satisfactory and reasonably safe, and for this they should be grateful.

Dr. A. T. EDWARDS referred to Professor Lambie's remarks and pointed out that in the case of *dementia paralytica* "negative" Wassermann reactions were not obtained when patients were treated by arsenicals only, but that since the introduction of heat therapy and chemotherapy it had been possible to obtain "negative" responses in blood and cerebro-spinal fluid to the Wassermann test. A small series of ten patients had been treated by Dr. Edwards with protein shock and chemotherapy, and five out of ten patients had given "negative" responses in blood and cerebro-spinal fluid to the Wassermann test.

Dr. J. A. L. WALLACE said that there was a promising field for the treatment of neurosyphilis by electropyræxia. Since their first experience of malaria in the Mental Hospitals Department of New South Wales in 1926, excellent results had been obtained with malarial treatment. Electropyræxia should perhaps not displace malaria, but

it had a very important place in the treatment of *dementia paralytica*. The Department of Mental Hospitals had appreciated Dr. Prior's work, and his paper was profoundly interesting and should stimulate further research.

Dr. Prior, in reply, thanked those present for the kind way in which his paper had been received and for the kind remarks made upon it.

In reply to Professor Lambie, Dr. Prior said that in no case of early syphilis had the response of the blood to the Wassermann test become "negative" by heat alone. Neymann had collected reports of 47 cases treated in America and said that heat alone could not cure syphilis. However, of Dr. Prior's cases, in Case LVIII, after forty-nine hours of heat and no drugs, the blood Wassermann reaction had become part-positive, and the Kline and Boas tests gave no reactions, when all the tests at the commencement of treatment had given fully positive results. Two other of his early patients had had a course of heat before receiving drugs, with no result to blood reactions except that in one instance the response to the Kline test changed from "4" to "negative".

Simpson had carried out comparative series of treatments, of the kind mentioned by Professor Lambie, and summed up his results by saying that the best and quickest results were obtained by the combined method of treatment.

As instances that heat did bring about results when drugs failed, Dr. Prior drew attention to the congenital cases, XLIV and LXVI, in which the patients, although treated for years with drugs, and although treatment was continued to the day of admission to hospital, developed general paralysis while under treatment. With heat their blood and cerebro-spinal fluid, which had given fully positive reactions, became fully "negative", and in Case LXVI the patient made a complete clinical recovery.

It had been shown that malarial patients did much better when treated with drugs in addition to the malaria. Dr. Prior regarded tuberculosis as a contraindication, as two of his patients developed this disease within twelve months of receiving hyperpyrexia.

To Dr. Bruce Hall Dr. Prior said that there were cases on record of optic atrophy which were said to be improved by heat therapy, but he had met nothing convincing. Little reliance could be put on Case LXVI, in which the patient apparently recovered the sight in one eye. Before treatment she had been very psychotic.

Dr. Prior did not wish to belittle the results obtained with malaria. He had seen wonders brought about by its means, but claimed that the serological reactions changed more quickly with electropyræxia. The fever was under complete control. No disease was given and there was no immediate death rate.

NOMINATIONS AND ELECTIONS.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Boyd, George, L.R.C.P., L.R.C.S., L.R.F.P.S., 1935 (Edinburgh), c/o Sydney Sanitarium and Hospital, Wahroonga.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Hayes, Horace Townsend, M.B., B.S., 1936 (Univ. Adelaide), Prince Henry's Hospital, Melbourne.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Ashburner, James Valentine, M.B., B.S., 1936 (Univ. Melbourne), Prince Henry's Hospital, St. Kilda Road, Melbourne, S.C.1.

Clarke, James Eric, M.B., B.S., 1934 (Univ. Melbourne), Fairfield Hospital, Fairfield, N.20.

Le Souef, Ronald Farquharson, M.B. et Ch.B., 1917 (Univ. Melbourne), Port Nepean Road, Chelsea, S.15.

- Long, Norman Pratt, M.B., B.S., 1936 (Univ. Melbourne), Alfred Hospital, Prahran, S.I.
 Millar, Archibald McLaren, M.B., B.S., 1936 (Univ. Melbourne), Prince Henry's Hospital, St. Kilda Road, Melbourne, S.C.I.
 O'Loughlin, Stanley Joseph, M.B., B.S., 1934 (Univ. Melbourne), 53, Broadway, Camberwell, E.C.
 Selby, Doris Adeline, M.B., B.S., 1937 (Univ. Sydney), Queen Victoria Hospital, Mint Place, Melbourne, C.I.

Medical Societies.

THE MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Carlton, on Wednesday, April 14, 1937, DR. ROBERT SOUTHWY, the President, in the chair.

Splenic Anæmia.

DR. A. P. DERHAM presented a patient, aged twelve years and eleven months, showing the after-effects of splenectomy that had been performed on October 23, 1935. He had been admitted to the Children's Hospital on October 31, 1933, suffering from anæmia of secondary type, associated with rise in temperature, but with no abnormal enlargement of liver or spleen. The patient was discharged convalescent on September 11, 1933, and did not come under notice again until he was admitted on September 4, 1935, with a history of illness for six weeks, pallor, anorexia, loss of weight and listlessness. For one week he had been passing dark coloured motions which were found to contain large quantities of changed blood, and for one day he had vomited several times, the vomitus being freely streaked with bright blood.

Dr. Derham said that examination had revealed a very pale, sick-looking boy, with a pulse of poor volume, a systolic bruit heard all over the precordium and enlargement of the liver three fingers' breadth below the costal margin. Dr. Derham said that at that stage the spleen was not demonstrably enlarged. There were large dilated veins in the upper abdominal and lower thoracic walls and signs of free fluid in the peritoneal cavity. The blood examination revealed a severe anæmia of secondary type, the red blood cells numbering 2,500,000, the white blood cells 13,000 per cubic millimetre, and the hæmoglobin value was estimated at 35%. The platelets numbered 480,000 per cubic millimetre and the bleeding time was two minutes, the coagulation time being five and a half minutes. The Van den Bergh and Fouchet tests gave no reactions and the serum failed to react to the Wassermann test. The fragility of the red blood cells was investigated; they were not unduly fragile. Dr. Derham said that after a transfusion of citrated blood the child's condition improved, but his liver remained enlarged and his spleen became enlarged and easily palpable. The diagnosis was considered to be splenic anæmia of Banti's type, and on September 23, 1935, Dr. W. D. Upjohn performed splenectomy. This was followed by an uneventful convalescence and a rapid recovery of normal health. The boy had been going to school, and at the time of presentation routine examination revealed no abnormality. Dr. Derham said that it was considered too early to be confident that a complete cure had been effected, but it was at least certain that splenectomy had prolonged the boy's life and had given him some years of health.

DR. IAN WOOD showed two patients illustrating splenic enlargement. One patient, a female, aged six years, suffering from acholuric jaundice, had had her spleen removed seven months before. Prior to the operation she had been pale, listless, miserable and irritable. The fragility of the red cells was greatly increased, hæmolysis beginning at 0.65% saline solution. The hæmoglobin value was 67% (Sahli). The enlarged spleen was removed by Dr. Douglas Stephens, and after an uneventful convalescence the patient recovered rapidly. At the time of the meeting the child

was bright, cheerful and robust and the hæmoglobin value had risen to 110%. The result of the fragility test was unchanged, as was the usual finding in these patients.

The other patient shown by Dr. Wood was a female, aged four years, who had failed to thrive from birth. Dr. Wood said that she was slightly undersized and suffered from irritability and general malaise. A few months before the meeting the mother had noticed that the abdomen was distended and hard. The patient had had occasional attacks of vomiting, but had never had hæmatemesis. On examination she was seen to be an undersized child with a prominent abdomen; some large veins ran up the anterior abdominal wall and the liver extended four fingers' breadth below the costal margin and the edge was regular but very hard. The spleen was palpable two fingers' breadth below the left costal margin and was also firm. The hæmoglobin value was estimated at 80% (Sahli); the red cells were found to number five million and the white cells ten thousand per cubic millimetre; the blood film did not present any abnormal appearances. The result of the fragility test was normal and the Wassermann test gave no reaction. Dr. Wood asked for opinions as to the prognosis and whether splenectomy would in any way improve the child's health.

DR. F. KINGSLEY NORRIS, after referring to a patient with mild anæmia and moderately enlarged spleen with no other abnormality, for whom he had advised the removal of the spleen, mentioned the case of another patient with acholuric jaundice, in which condition splenectomy was indicated. He found it difficult at times to decide when the splenectomy should be done and stated that the patient had been under observation for four years, and, without splenectomy, no appreciable anæmic state had developed.

DR. RUSSELL HOWARD referred to the unusual feature in the case of hæmolytic jaundice shown by Dr. Ian Wood; no other members of the family were involved, which was in contrast with his experience at the Children's Hospital, for instance, with a number of members of the Lunn family. As the subjects of this condition were liable to get aplasia or hæmolytic crises suddenly, he advocated the early removal of the spleen. On the other hand, splenectomy was not advised in Banti's disease because the portal cirrhosis would go on; if such a patient had hæmatemesis, splenectomy might control the progress of the disease temporarily. J. R. Hanrahan divided this class of patients into those in whom the platelets were normal or increased in number, and those in whom the platelets were decreased in number; splenectomy was not advised in the former group on account of the liability to post-operative thrombosis, but was advised in the latter group.

Dr. Ian Wood said that he had found it rather hard to arrive at a definite conclusion concerning splenectomy in splenic anæmia. It was striking that there was very little perisplenitis or formation of adhesions in acholuric jaundice in comparison with the difficulties encountered in the removal of the spleen in splenic anæmia. Though the cause was not clear, there was strong evidence in favour of infection and there was a definite tendency for the condition to be progressive, but he was sure that some of the patients improved after splenectomy. If the patient had two years even of happy healthy life instead of invalidity there was something to be said in favour of removing the spleen. The question of the platelets referred to by Dr. Howard was still vehemently disputed and should not preclude splenectomy. Though the outlook was almost hopeless, Dr. Wood thought that the operation should be performed.

Spina Bifida Occulta.

DR. H. LAWRENCE STOKES showed a girl, aged fourteen years, who was in perfect health. His object was to draw attention to the radiographic evidence of the presence of *spina bifida occulta* of the first sacral vertebra, first obtained two years earlier and still demonstrable two weeks before the meeting. While being treated in the out-patient department at the age of twelve years for a minor complaint, the child had complained of lumbar pain

over a period of a few weeks. On comparing the two films it was seen that definite growth of the posterior ramus had occurred in the interval to such an extent that the ends appeared to overlap slightly. No further symptoms of pain had occurred and general and careful neurological examination had failed to reveal any signs.

Dr. KEITH HALLAM stated that the degree of *spina bifida* seen in this patient was not uncommon, but it was unusual to be able to demonstrate the closure in such a brief period as two years. Perhaps minor therapeutic trauma might have led to an osteochondritic process that had hastened the approximation of the rami.

Rectal Stenosis.

Dr. WILFRED FORSTER showed a male infant, aged eight months, who had been born with imperforate anus. Perforation had been effected simply, but rectal stenosis had followed. Under general anaesthesia, with firm pressure, the tip of a thermometer case was introduced with difficulty into the anus; the passage was scarred and irregular and bled easily; it was not covered with mucous membrane. Uterine dilators up to the size of the ring finger were introduced, but free bleeding occurred. He had managed to treat the condition successfully by means of dental Godiva moulded into a stem with a guard to prevent its disappearance into the rectum. This instrument was worn permanently by the baby and was removed only at the time of feedings and to allow of the passage of stools. Larger instruments had been moulded from time to time and a surprisingly large one was in position at the meeting. Before treatment the baby had persistently had loose diarrhoeal stools, but after treatment for six months the anus was of normal size and was covered by definite epithelium and the baby had sphincteric control.

Dr. WHITAKER congratulated Dr. Forster on the brilliant result he had obtained with the mould of dental Godiva.

Dr. H. DOUGLAS STEPHENS said that cases of imperforate anus could be classified into those closed at the skin, those with an entrance to the proctodeum only and those in which the rectum itself as well as the proctodeum was affected. Those cases falling into the third group were very troublesome to treat. Dr. Stephens had a patient, now fourteen years of age, upon whom he had operated when the patient was only a few months of age; he had made a horseshoe incision around the anus and had joined the rectum and proctodeum. Dilatation had been carried out regularly every six months for a number of years, and since then he had seen the patient once a year; on the last occasion she had had no constipation or any other local trouble and the rectum allowed of the passage of a large bougie. When imperforate anus was complicated by recto-vaginal fistula, the management was always very troublesome, but the ultimate prognosis of imperforate anus due to obstruction low down was very good.

Hereditary Deforming Chondrodysplasia.

Dr. Forster also showed a boy, aged five years, with numerous bony lumps which were gradually becoming more prominent. They had been noticed by the boy's mother for at least eighteen months. One of the bony prominences was especially large and involved the ankle. Apart from the interest of the condition as rare, Dr. Forster said that he showed the boy to ask for suggestions concerning the treatment of the tumour in the tibia which looked as if it would soon give rise to some deformity in the ankle and interfere with walking.

Dr. J. B. COLQUHOUN said that neither gross deformity nor marked disability was present yet, though the swelling at the distal end of the tibia might cause pain by pressure on the fibula. Some two years earlier Dr. Colquhoun had seen a patient with a similar condition which had progressed until the fibula was thinned out like a piece of tape; pain was caused, but the patient did not get a varus deformity of the foot.

Dr. KEITH HALLAM regarded the condition as interesting from the radiological aspect and referred to the Merk Jansen theory of an imbalance of the elemental structures and the rising tide of bone formation and the ebb of cartilage with remnants of cartilaginous rests and exostoses with cartilaginous tips developing at the insertions. He also mentioned the theory of periosteal deficiencies at the insertion and the formation of exostoses on account of the pull of the muscles. The tumours grew larger during the period of growth of the child and then ceased to grow larger. He believed that the general opinion was that they should be left very severely alone.

Dr. DOUGLAS STEPHENS inquired whether anyone present had seen angiomata or blood tumours associated with the lesions in the condition under discussion; he had seen a case of angiomata with tubular formation, but had not seen the association with exostoses and he wondered whether they were two different syndromes. Though he agreed that as a rule deformities did not occur, he had seen one exostosis in the spine which was the cause of paraplegia.

Dr. Forster added that if an exostosis was to be removed, it was important that the removal should be very complete; incomplete removal only stirred the exostoses up and caused further trouble.

Myositis Ossificans.

Dr. Forster also showed a boy who had developed *myositis ossificans* after a fracture of the lower end of the humerus with some backward displacement of the lower fragment. The condition had shown up very definitely six weeks after the original accident, at which time the elbow was completely fixed so that practically no movement was possible. Dr. Forster reported that he had simply put the limb at rest in a plaster for nine months. He demonstrated a series of radiographic films in which it could be seen that the bony spur had almost completely disappeared. He also showed by the movements the child could perform that function was returning rapidly.

Infantile Scurvy.

Dr. S. W. WILLIAMS showed a female infant, aged nine months, who had been in the hospital for one month on account of Barlow's disease. On admission she was a pale irritable baby with whooping cough; the gums were engorged and spongy and bled easily. Dr. Williams said that there were tenderness and thickening of the lower end of the left femur with slight tenderness of the right femur and of the radii; the costo-chondral junctions were prominent, forming a "rosary"; the urine contained a few red blood cells. Eight weeks before the child's admission to hospital it had become irritable and seemed to have severe pain in the left leg. At that time radiographic evidence was thought to be suggestive of the presence of rickets, and treatment for rickets was started with some improvement in the condition of the child. However, one week before its admission to hospital, the child seemed to have severe pain and slight swelling was found just above the left knee joint with bleeding of the gums and redness of the urine. The child had been fed for some time on cow's milk which was usually simmered for three hours when the daily supply was prepared; no orange juice had been given, but recently two teaspoonsful of prune juice had been given each day; it had been ascertained that the milk supplied by the dairyman was pasteurized before delivery; the cough had become pronounced three days before the child's admission and broncho-pneumonia developed while the child was in hospital. Dr. Williams considered that the child probably had both scurvy and rickets; one and a half ounces of orange juice and six ounces of tomato juice and ten drops of "Ostelin" had been administered daily when possible, and though the left femur was still slightly swollen, it was less tender than it had previously been and the other bones were no longer tender.

Dr. A. P. DERHAM concurred in the view that some rickets was present as well as scurvy.

Dr. J. B. COLQUHOUN, after referring to the prevalence of the deficiency conditions in Scotland and in other countries in which he had practised, stated that he recognized in this case the angular type of "rosary" which was characteristic of scurvy in contradistinction to the much flatter "rosary" of rickets. He urged that an attempt should be made to prevent slipping of the lower femoral epiphysis by means of a plaster of Paris splint with slight flexion at the knee joints.

Dr. H. BOYD GRAHAM referred to the importance of telling people who had the care of babies that the orange juice which was advised as part of the régime was intended to prevent scurvy and not primarily to secure regular actions of the bowels; the superiority of orange juice over other anti-scorbutics should also be emphasized.

Dr. RUSSELL HOWARD expressed his opinion that the condition was typical of scurvy without the presence of rickets.

Dr. Derham spoke again and said that in spite of what had been said by Dr. Colquhoun and Dr. Howard he still considered that a minor degree of rickets was present as well as a lot of scurvy and asked Dr. Hallam if he would comment on the films.

Dr. KEITH HALLAM described the ghost-like appearance of the epiphysis with stippling, but said that he would require more evidence before he could exclude the presence of rickets.

Dr. H. DOUGLAS STEPHENS mentioned the commercial synthetic preparations of vitamin C which were now obtainable and said that by means of the use of these tablets he had in eight days enabled a patient to recover from scurvy.

Dr. ROBERT SOUTHEY said that the anti-scorbutic vitamin was not destroyed when tomato juice was canned by the process of heating in the absence of air.

In reply to the discussion, Dr. Williams said that though in the early stages the condition had been regarded as rickets, scurvy was present very definitely and the characteristic radiographic appearances of scurvy could be seen on close inspection of the films. He also referred to the memorial number of the *Archives of Diseases of Children* which had been published a few years ago while Barlow was still living at the age of about ninety years. There was no doubt that rickets and scurvy could occur together, but more work was required before the respective elements in a complicated case could be assessed with scientific accuracy.

Sarcoma of the Neck of the Femur.

Dr. J. G. WHITAKER showed a girl, aged nine years, who came under his care at the hospital complaining of pain in the hip for two months. A skiagram in November, 1936, presented the appearances of apparent osteomyelitis of the neck of the femur; a later one in March, 1937, showed that the disease had progressed considerably, but the diagnosis was left in doubt. At an exploratory operation the curious feature was the lack of hemorrhage, and Dr. Whitaker removed a piece of tissue for histological examination. In his report, Dr. Reginald Webster stated that there could be no question as to the presence of a neoplastic process and equally none regarding its malignant character. The microscopic sections showed a fasciculated spindle-celled growth which exhibited a high degree of anaplasia; he could say fairly that it was quite undifferentiated, for no cartilaginous, osseous or even osteoid tissue could be detected. There were one or two fields in which deposition of calcium salts was to be observed, but they were of the nature of calcareous deposit in degenerated tissue rather than the calcification of an ossifying process. Three biopsy fragments chosen for sections all showed a very homogeneous and very cellular growth and the diagnosis from a chronic inflammatory condition was not as difficult a problem as might have been

presented. A possibly mitigating circumstance was that the tumour did not show a very high degree of vascularity; on the other hand, degenerative and necrotic areas were to be seen microscopically.

Dr. H. DOUGLAS STEPHENS said that he thought that deep X ray therapy was indicated in the treatment of the sarcoma.

Dr. PAUL JONES said that he had seen one hindquarter amputation in an adult, but he had also seen good results follow deep therapy; by this he meant a prolongation of life.

Dr. J. B. COLQUHOUN considered that the delay in diagnosis was not surprising because hindsight was easier than foresight in sarcoma. He had been associated with a very unfortunate experience when at an American hospital; the fluid obtained looked like pus and the wound was packed and put up in plaster of Paris; when cut down a month later it was noticed that fungation was starting, but it was thought to be granulation tissue and plaster was again applied and left on for two months; the wound was then a huge fungating mass. The report on the slides at first indicated a chronic inflammatory lesion, but, when reviewed later, some Ewing's tumour cells were seen. The use of deep therapy brought about a disappearance of the tumour, but the patient died. Dr. Colquhoun favoured deep X ray therapy in the case of the patient shown by Dr. Whitaker rather than the hindquarter amputation, and thought that Coley's fluid, which was available from the Commonwealth Serum Laboratories, should be used as well, because it had been claimed that by using it some patients had recovered.

Dr. RUSSELL HOWARD also advised against operation and stated that the deformity produced by the operation was terrific, and that as the process had been going on for at least six months it was probable that secondary dissemination had commenced, though the skiagram of the lung did not show any deposits.

Dr. Whitaker, in reply, emphasized the wisdom of remembering the possibility of sarcoma when operating on any connective tissue condition and expressed the opinion that it could not be diagnosed in the early stages by radiographic methods.

Correspondence.

A SYMPOSIUM ON CANCER.

SIR: Mr. Poate has very courteously provided me with a copy of the letter which he has sent to you in reply to mine published in THE MEDICAL JOURNAL OF AUSTRALIA of May 15, 1937.

I most certainly do not include Mr. Poate among the intransigent surgeons. But that there are many of these is only too apparent to those who practise radiotherapy.

The hostile criticism which it is suggested came from me was not so in fact, but only a reply to what I took to be unwarranted assumption by Sir Alan Newton of the value of comparison of surgical results in cancer of the lip with those obtained by radiotherapy at the hands of an inexperienced committee. The results obtained by this committee in its earliest days were selected by the College of Surgeons for Dr. MacMahon's inquiry. I must disclaim any criticism of Dr. MacMahon's work, and regard his paper as being most valuable, but wish to warn readers against assuming too much from the subject matter.

It was not the radiotherapist in the guise of a schoolboy that voluntarily entered the ring against the pugilist; it was the pugilist, in the form of the College of Surgeons, who challenged the schoolboy, as personified by the early Treatment Committee at the radium clinic at the Royal Prince Alfred Hospital.

Mr. Poate is a surgeon, and, therefore, an operation to him does not inspire so much fear as it does to a patient. But that that fear and its deterrent effect are very real in a large proportion of patients must be quite obvious.

The intolerance mentioned at the end of Mr. Poate's letter is, I feel sure, much more pronounced in the case of many surgeons and expressed against radiotherapy than in the minds of the great majority of radiotherapists and expressed against surgical measures, except where experience teaches them that equally good or better results can be achieved by radiation.

I have nothing but commendation for those surgeons who display the reasonable attitude adopted by Mr. Poate. Would that they all did so.

It is quite common in radiotherapeutic practice to find that the patient or a relative has been told by the surgeon, who has found it impossible to apply surgical excision with any hope of eradicating the disease, that radiation treatment is of no value. Even if the majority of such patients are not cured, many of them are provided with alleviation, and quite a number are actually cured by radiation undertaken in spite of the surgeon's advice. How many are lost, it is impossible for us to estimate.

On the other hand, I have never failed to refer patients for surgical treatment when I have found that the nature of the growth or the involvement of glands has made this form of treatment preferable to that which I could supply.

Carcinoma of the lip in my series includes only those lesions which originated on the red exposed portion of the lip, which I regard as mucous membrane. Any that arose in the skin are classed as carcinoma of the skin as far as I am concerned. In another place, Mr. Poate refers to the "inner" surface of the lip, a very rare site, in my experience, for the origin of carcinoma. Perhaps we are at cross purposes in this matter.

Yours, etc.,

E. H. MOLESWORTH.

235, Macquarie Street,
Sydney,
May 25, 1937.

HEREDITARY MULTIPLE TELANGIECTASIA.

SIR: In regard to Dr. G. A. D. McArthur's article in the journal of May 22, it may be of interest to give the family history from a series of cases of this condition, which I saw in Sydney nearly twenty years ago. I reported them together with microphotograph of a section in *The British Journal of Dermatology*, January-March, 1918. It was probably the first occasion in which these cases had been reported as occurring in Australia.

"Family History.—The disease can be traced back as far as the great-grandmother, and both her daughters, i.e., the grandmother of the present patient, and her sister exhibited the condition. The latter died of anæmia, and of her family of five sons and two daughters, three of the sons are known to have been affected, one of these dying from anæmia. Reverting to the direct ancestors of the patient, the grandmother had a family of eight children, consisting of five sons, three of whom were affected, and three daughters, of whom two were affected. Of the latter, one, the mother of the patient, died of anæmia, and of her family of seven sons and two daughters, six sons and two daughters are affected. The patient states that 'one of the brothers has a number of similar spots on the shoulders and abdomen, and another has a like condition affecting his waist'. The members of the patient's family, a boy, aged three years, and a girl, aged seven years, have recurrent epistaxis, but no angiomata. Both the patient's mother and grandmother had angiomata beneath the finger nails and on the fingers, as well as those situated on the face and mucous membranes."

Yours, etc.,

NORMAN PAUL.

"Harley",
143 Macquarie Street,
Sydney,
May 25, 1937.

NEWS, NEWSPAPERS AND MEDICAL PRACTITIONERS.

SIR: The attention of this office has been drawn to the leading article in your issue dated April 17 under the heading "News, Newspapers and Medical Practitioners", particularly the uncalled-for reflection upon the attitude of newspaper editors to any reasonable representations that might be made to them on any question.

The Press of Australia generally and of the members of this Conference—which comprises the capital city daily newspaper proprietaries of the Commonwealth—in particular, stand upon a very high footing in British journalism; and for a responsible technical journal such as yours, to treat their editors with the contumely contained in the last sentence of the article is one which calls for protest. While certain contentions in your article might well form the subject of difference of opinion, especially when viewed from the particular standpoint of what reputable newspapers regard as their responsibility to the public, there should be no two opinions about the injustice of the innuendo to which attention is directed above. In holding up newspaper editors generally to contempt, as you have done, is considered both unjust and unwarranted.

Yours, etc.,

A. C. C. HOLTZ,

Executive Chairman.

Australian Newspaper Conference,
Collins Gate,
Collins Way,
377, Little Collins Street,
Melbourne, C.I.,
May 28, 1937.

Obituary.

THOMAS ERNEST GREEN.

We are indebted to Dr. H. Boyd Graham for the following appreciation of the late Dr. Thomas Ernest Green.

With the death of Dr. Thomas Ernest Green a popular and brilliant man with a host of friends and well-wishers, has passed from our midst.

He was born on July 26, 1872, at Campbelltown, New South Wales, where his father, the late Reverend S. I. Green, was the minister in the Congregational Church. Thomas Green, after a brilliant career at Scotch College, Melbourne, obtained a resident scholarship to Ormond College, University of Melbourne. He entered on the medical curriculum at the university in 1890 and obtained numerous honours, including first class honours in anatomy, pathology, therapeutics, medicine, surgery, midwifery and forensic medicine. He gained the final scholarship for medicine and forensic medicine as well as the Beane Scholarship for Pathology. In addition to these brilliant academic achievements he took a prominent part in sport and represented the university in cricket and football and was also successful in winning the sprinting championship. After graduation in 1895, he was a resident medical officer at the Melbourne Hospital in 1896, and pursued still further his studies in practical pathology in the laboratory at the university. In the following years he was resident medical officer at the Brisbane Hospital.

In 1898 he went to Bendigo and entered on his life's work, for he remained in practice there until 1929, becoming one of Bendigo's most distinguished citizens. He displayed a special aptitude for medicine and surgery of children, but had a large general practice and was senior honorary physician at the Bendigo Hospital from 1902 till he came to Melbourne in 1929. He was instrumental in having the Commonwealth Government Health Laboratory established at Bendigo, and took part in practically every public movement in Bendigo of professional or general

interest. He was one of the best known cricketers in Victoria outside Melbourne, and captained the Bendigo team against the Englishmen. He was also an excellent golfer, and at one time had a handicap of two. For many years he was a member of the Melbourne Cricket Club and of the Royal Melbourne Golf Club, and frequently found time to come to Melbourne, especially for meetings of the Victorian Branch of the British Medical Association and of the Melbourne Paediatric Society, as well as to attend sporting fixtures. He took an active part in politics, and in 1920 was awarded the C.B.E.

In 1929 he left Bendigo and soon established a large practice in Collins Street, Melbourne, in which he continued to devote his energy and his undoubted ability to his patients. Thomas Green had the reputation of being the most frequent visitor to the library in the British Medical Association Building, as a result of the lifelong zeal which made him search for information concerning every interesting aspect of his clinical work. It was this studious habit and the mental energy behind it which made him so prominent in the eyes both of his colleagues and of his patients. We offer our sympathy to his widow and family, to Dr. F. W. Green, his only surviving brother, and to his sisters.

Dr. Basil Kilvington writes:

It is many years since the late Thomas Ernest Green and I were boys together at Canterbury. After a brilliant medical course he qualified with the late Dr. Ritchie, of Horsham, these two taking all the prizes in the final examinations.

He was a resident under the late Dr. John Williams at the Melbourne Hospital, and, like his senior, his tuition to the students was excellent, and I still recollect some of his clinical talks. From Melbourne he went to Brisbane, and here he imbibed his liking for diseases of children, which he maintained for the remainder of his life. His next move was to Bendigo, where he spent the best part of his life. He had an immense practice and was universally popular. T. E. Green was not only a success in his profession, but he was also a noted sport, excelling in tennis, cricket and golf. He also played a prominent part in public affairs and was chairman of committee for Mr. W. M. Hughes when that gentleman represented Bendigo in the Federal House. At that time the two were inseparable.

But Green always put his work before everything else and used to come from Bendigo to attend almost every paediatric meeting at the Children's Hospital in Melbourne.

About seven years ago he commenced practice in Collins Street, where his wide experience, cheery manner and profound common sense soon gave him a very large practice. His opinion was sought after by many of the Collins Street men.

For some two or three years his health had not been good and he realized the heart affection that he had would sooner or later prove fatal, but he elected to carry on his work and die in harness. On the very day he died he was seeing patients at his rooms in the city. Who could wish for a better ending than this? The medical profession has lost one of its most brilliant and lovable members, and all who knew him—and these are many—feel a deep loss in his passing on. To his widow and children, and also to his only surviving brother, Dr. F. W. Green, of Collins Street, we offer our deepest sympathy.

Tom Green was not an old man, but he had played a great part in his life, and his memory should be an inspiration to his fellows.

Dr. John Dale writes:

The late Dr. T. E. Green will be sorely missed by his circle of friends as by his patients, for he was one of the liveliest, wisest and kindest of men.

Up to date and meticulously painstaking in his work—just before his death he was preparing a paper for the journal which will, I hope, be published—he yet found time to take a keen interest in all the ordinary sports, at which in his younger days he had excelled, as well as in the arts and literature and in social reform.

I cannot forget him on the third day after a cholecystectomy sitting up in bed, cheerful as a willy wagtail, enjoying a hearty meal.

No medical meeting, sports meeting, cricket match, exhibition of paintings or concert took place but that "Tommy" would be there if he possibly could, and his wide sympathy and understanding for the underdog was shown in the interest he took in reform movements and the practical support which he gave to them.

His zest in life indeed was such that he lived every moment of it, and, despite the presence of that enemy within him which for many years periodically threatened him and eventually overcame him, he was to the last irrepressible and was one of the healthiest men I have ever known.

On the Saturday afternoon before his death he was following the principal football match and a few hours later he was dead. Praised be his name.

Dr. A. Waldo Connelly writes:

Dr. T. E. Green and I were boys together and at the university we were friends and companions even in our work. We were together as students at the Women's Hospital, and later we were associated at the Bendigo Hospital. In Bendigo it was Dr. Green who first became very expert at intubation for laryngeal diphtheria, and he showed the technique to me and to many others. When I was placed in charge of the special children's ward he used to come along frequently and often gave me information and valuable assistance. We also played tennis together and were excellent friends through life. He and I and Dr. A. C. F. Halford had lunch together quite recently before "Prof." Halford went to England, and we were yarning of old times then. I will miss him sorely.

Post-Graduate Work.

COURSE OF RADIATION THERAPY IN THE TREATMENT OF CANCER.

THE New South Wales Post Graduate Committee in Medicine announces that, in conjunction with the Cancer Research Committee of the University of Sydney, it will hold a course of instruction in radiation therapy in the treatment of cancer during a period of three weeks commencing Monday, June 28, 1937. This course is designed for those who wish to qualify in the treatment of cancer by radiation.

The programme is as follows.

First Week.—Physics, X rays and radio-activity. Ten lecture-demonstrations will be given by Professor O. U. Vonwiller, Dr. G. H. Briggs, Dr. W. H. Love and Mr. A. S. A. Harper, M.Sc., in the Department of Physics each afternoon at 4 p.m. and each evening at 8 p.m., as follows:

Lectures 1 and 2, Monday, June 28: "General Review of Physics".

Lectures 3 and 4, Tuesday, June 29: "The Production and Properties of X Rays".

Lectures 5 and 6, Wednesday, June 30: "X Rays in Relation to Matter".

Lectures 7 and 8, Thursday, July 1: "X Ray Measurements and the Effects of X Rays".

Lectures 9 and 10, Friday, July 2: "Radio-Activity".

Each lecture will be illustrated by experimental demonstrations. If possible, members of the class will have personal manipulation of apparatus and make measurements. This will depend on the numbers attending.

Second Week.—Pathology and the treatment of regional cancer, with special reference to radiation therapy. Five lectures and five demonstrations will be given. The demonstrations will be given each day during the second week by Professor D. A. Welsh in the Pathology Department of the New Medical School at 4 p.m. The evening lectures,

which will be given at 8 p.m. in the Robert H. Todd Assembly Hall, 135, Macquarie Street, are as follows:

- Monday, July 5: "Cancer of the Breast", Dr. B. T. Edye.
 Tuesday, July 6: "Cancer of the Lip and Tongue", Dr. J. S. MacMahon.
 Wednesday, July 7: "Cancer of the Skin", Dr. Langlois P. Johnston.
 Thursday, July 8: "Cancer of the Female Genital Organs", Dr. F. A. Maguire.
 Friday, July 9: "Cancer of the Alimentary Canal", Dr. F. P. Sandes.

Third Week.—Application of radiation (alone, post-operative and pre-operative). Five afternoon clinical demonstrations in the administration of radium and deep X rays will be given as follows:

- Monday, July 12, 2.30 to 5 p.m., at Saint Vincent's Hospital (Dr. de Monchaux).
 Tuesday, July 13, 2 to 5 p.m., at Royal Prince Alfred Hospital (Dr. Frecker).
 Wednesday, July 14 (not yet arranged).
 Thursday, July 15, 2 to 5 p.m., at Royal North Shore Hospital (Dr. Ham).
 Friday, July 16, 9.30 to 10.30 a.m., at the Prince Henry Hospital (Dr. Parkinson).
 Friday, July 16, 2 to 5 p.m., at Sydney Hospital (Dr. Parkinson).

The fee for the course will be £5 5s. Those wishing to attend should apply to the Secretary, New South Wales Post-Graduate Committee in Medicine, the University of Sydney.

Legal.

ROCHE *versus* QUICK.

The action commenced by Dr. Roche against Mr. Balcombe Quick was on the 26th day of May, 1937, struck out by His Honour Mr. Justice Gavan Duffy, counsel for Mr. Balcombe Quick announcing to the court that Dr. Roche having alleged in this action that Mr. Balcombe Quick made defamatory statements against him at Hamilton Russell House, Mr. Balcombe Quick desires to state unreservedly with respect thereto that he did not reflect either upon Dr. Roche's honour or skill as an operating surgeon. Mr. Balcombe Quick expresses regret that any statement he made either to the sister-in-charge at Hamilton Russell House or to any other person there could have been taken as any reflection upon Dr. Roche's honour or skill and if any such statement was so taken he absolutely withdraws the same.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1925 to 1935*, of Queensland, as duly qualified medical practitioners:

- Higgin, Ascelin Roger Perceval, M.B., B.S., 1934 (Univ. Sydney), Maryborough.
 Kelly, Joseph Peter, L.R.C.S., 1883, L.R.C.P., 1886 (Ireland), Brisbane.
 Lindsay, William Edward, M.B., B.S., 1936 (Univ. Sydney), Townsville.

McDonald, Hew Fancourt Graham, M.B., B.S., 1937 (Univ. Melbourne), Brisbane.

Phillips, Leigh Holdsworth Allen, M.B., B.S., 1937 (Univ. Sydney), Brisbane.

Porter, Ronald Ernest, M.B., B.S., 1936 (Univ. Sydney), Toowoomba.

White, Salome Jean, M.B., B.S., 1929 (Univ. Melbourne), Normanton.

Corrigendum.

OUR attention has been drawn by Dr. C. E. M. Gunther to two errors occurring in his paper, "The Serology of Sixteen Cases of Endemic Typhus in New Guinea", which was published on March 20. On the eighth line, in the sentence reading "The first two cases of endemic typhus occurred at Bulwa", the words "of endemic typhus" should be omitted. The remarks on Case XI shown in the table at the conclusion of the paper should read "Recovered. A two months abortion on the eighth day."

NOTICE.

BRISBANE "COURIER-MAIL" NUTRITION SUPPLEMENT, 1937.

THE Brisbane *Courier-Mail* will be publishing the 1937 Nutrition Supplement on June 14 or soon thereafter.

The management of the *Courier-Mail* has been gratified by the interest and kind reception that was accorded the 1936 Nutrition Supplement by the British Medical Association in Australia. In appreciation of that interest, the management would be pleased to dispatch, free and postage paid, a copy of the forthcoming supplement to any interstate member of the Association. It will be necessary for interstate members desirous of receiving a copy to have their applications in the hands of the *Courier-Mail* before the tentative date of publication. Requests should be addressed to the Manager, *Courier-Mail*, Brisbane.

THE next meeting of the Australian Army Medical Corps Officers' Mess, Second Military District, is to be held at the Imperial Service Club, Barrack Street, Sydney, on Saturday, July 3, 1937, at 8 p.m., when members will be asked to consider a motion to discard the existing rules, and in lieu thereof to adopt a revised constitution and by-laws.

After the termination of business, Dr. C. E. W. Bean, official historian, will address the meeting. Those officers, past or present, who intend to be present are asked to notify the Honorary Secretary, Australian Army Medical Corps Officers' Mess, Victoria Barracks, Paddington.

Books Received.

THE COMMON NEUROSES, THEIR TREATMENT BY PSYCHOTHERAPY: AN INTRODUCTION TO PSYCHOLOGICAL TREATMENT FOR STUDENTS AND PRACTITIONERS, by T. A. Ross, M.D., F.R.C.P.; Second Edition; 1937. London: Edward Arnold and Company. Demy 8vo, pp. 248. Price: 10s. 6d. net.

THE MEDICAL ANNUAL: A YEAR BOOK OF TREATMENT AND PRACTITIONERS' INDEX, 1937, edited by H. L. Tidy, M.A., M.D. (Oxon), F.R.C.P., and A. R. Short, M.D., B.S., B.Sc., F.R.C.S.; 1937. Bristol: John Wright and Sons, Limited; London: Simpkin Marshall Limited. Demy 8vo, pp. 778. Price: 30s. net.

Diary for the Month.

JUNE 15.—New South Wales Branch, B.M.A.: Ethics Committee.
 JUNE 16.—Western Australian Branch, B.M.A.: Branch.
 JUNE 17.—New South Wales Branch, B.M.A.: Clinical meeting.
 JUNE 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 JUNE 23.—Victorian Branch, B.M.A.: Council.
 JUNE 24.—New South Wales Branch, B.M.A.: Branch.
 JUNE 25.—South Australian Branch, B.M.A.: Branch.
 JUNE 26.—Queensland Branch, B.M.A.: Council.
 JULY 1.—South Australian Branch, B.M.A.: Council.
 JULY 2.—Queensland Branch, B.M.A.: Branch.
 JULY 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 JULY 6.—New South Wales Branch, B.M.A.: Council (Quarterly).
 JULY 7.—Western Australian Branch, B.M.A.: Council.
 JULY 7.—Victorian Branch, B.M.A.: Branch.
 JULY 9.—Queensland Branch, B.M.A.: Council.
 JULY 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments.

Dr. L. S. Woods has been appointed to be Visiting Surgeon to Albury Gaol, Albury, New South Wales.

Dr. R. H. Morgan has been appointed Out-Patients' Registrar of the Adelaide Hospital, Adelaide.

Dr. M. Staricoff has been appointed Medical Officer of Health, under the provisions of the *Health Act*, 1911-1935, of Western Australia.

Dr. D. A. J. Hunwick has been appointed Quarantine Officer at Port Lincoln, South Australia, under the provisions of the *Quarantine Act*, 1908-1924.

Dr. D. K. McKenzie and Dr. J. D. Rice have been appointed Honorary Anaesthetists at the Adelaide Hospital, Adelaide.

Dr. H. H. Harrison has been appointed Honorary Ear, Nose and Throat Surgeon to the Lidcombe State Hospital and Home, New South Wales.

Dr. D. A. J. Hunwick has been appointed Honorary Medical Officer at the Port Lincoln Hospital, South Adelaide.

Dr. R. Le P. Muecke has been appointed Inspector of Anatomy under the provisions of the *Anatomy Act*, 1930, of Western Australia.

The following have been appointed, under the provisions of the *Hospitals Act Amendment Act*, 1921, of South Australia, to be members of the Adelaide Hospital Advisory Committee: Dr. F. S. Hone, Dr. C. T. C. de Crespigny, Dr. A. M. Cudmore, Dr. E. A. Johnson, Dr. W. Ray and Dr. I. B. Jose.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xx to xxii.

BRISBANE CITY COUNCIL, QUEENSLAND: Medical Officer of Health.

FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Junior Resident Medical Officers.

RENWICK HOSPITAL FOR INFANTS, SUMMER HILL, NEW SOUTH WALES: Resident Medical Officer.

TARA DISTRICT HOSPITAL, TARA, QUEENSLAND: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 235, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Prosperpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 179, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.